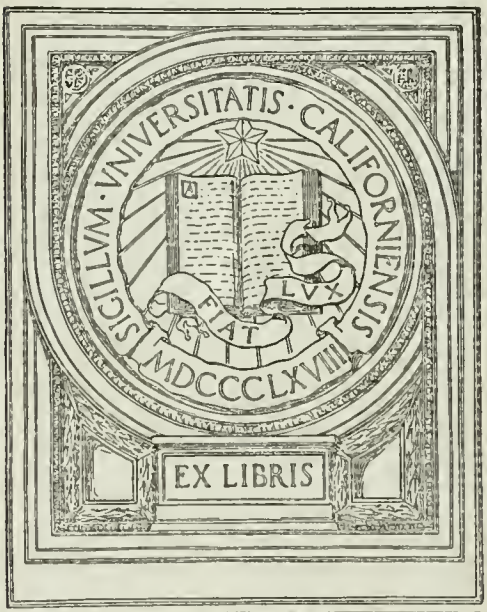
UNIVERSITY OF CALIFORNIA
AT LOS ANGELES



# Social England

ILLUSTRATED EDITION—Vol. VI

*FROM THE BATTLE OF WATERLOO TO THE GENERAL ELECTION OF 1885*

ULYSSES DERIDING POLYPHEMUS, BY J. M. W. TURNER, R.A.

*(National Gallery.)*

# SOCIAL ENGLAND

A Record of the Progress of the People

*In Religion, Laws, Learning, Arts, Industry, Commerce, Science, Literature and Manners, from the Earliest Times to the Present Day*


EDITED BY

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6838


VOLUME VI


NEW YORK: G. P. PUTNAM'S SONS

LONDON: CASSELL AND COMPANY, LIMITED

1904



JAN 1907

First Edition *June* 1897.
*Reprinted* 1898.
Illustrated Edition 1904.

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# CONTENTS.

PAGE

List of Coloured Plates . . . . . viii
Notes to Illustrations . . . . . ix
List of Contributors . . . . . li
Prefatory Note (*J. S. Mann*) . . . . . liii

## CHAPTER XXI.

*PEACE, RETRENCHMENT, AND REFORM.* 1815-1832.

Introductory (*H. D. Traill*) . . . . . 1
Political History (*Lloyd C. Sanders*) . . . . . 2
The Navy (*W. Laird Clowes*) . . . . . 15
The Church (*W. H. Hutton*) . . . . . 26
Literature (*H. D. Traill*) . . . . . 32
Painting (*Reginald Hughes*) . . . . . 48
Music and Society (*H. Sutherland Edwards*) . . . . . 72
Geology, 1815–1846 (*T. G. Bonney*) . . . . . 76
Chemistry (*Robert Steele*) . . . . . 86
Medicine and Surgery (*D'Arcy Power*) . . . . . 89
The Textile Industries, 1815–1851 (*H. Riddell*) . . . . 95
Agriculture, 1802–1832 (*R. E. Prothero*) . . . . . 102
The Social Economy (*J. E. Symes*) . . . . . 115
Social Life (*Mary Bateson*) . . . . . 127
Scotland (*James Colville*) . . . . . 141
Ireland (*P. W. Joyce*) . . . . . 145
Authorities, 1815–1832 . . . . . 150

## CHAPTER XXII.

*THE NEW SPIRIT AND THE NEW PATHS.* 1832-1846.

Political History (*Lloyd C. Sanders*) . . . . . 152
The Army (*G. Le M. Gretton*) . . . . . 166
The Navy (*W. Laird Clowes*) . . . . . 175

PAGE

The Church (*W. H. Hutton*) . . . . . 182
The Free Churches, 1815–1885 (*John Brown*) . . . 196
Literature (*H. D. Traill*) . . . . . 209
The Developments of Painting (*Reginald Hughes*) . . 230
Architecture, 1815–1840 (*Reginald Hughes*) . . . . 234
Astronomy, 1815–1846 (*A. M. Clerke*) . . . . . 239
Physics, 1800–1846 (*W. G. Rhodes*) . . . . . 248
Chemistry (*Robert Steele*) . . . . . 259
Public Health, 1815–1846 (*D'Arcy Power*) . . . . 264
Mining and Metallurgy, 1815–1846 (*H. C. Jenkins*) . . 267
The Railway System (*Lord Farrer*) . . . . . 273
Agriculture (*R. E. Prothero*) . . . . . 290
The Social Economy (*J. E. Symes*) . . . . . 298
Prison Discipline and Prison Reform (*Arthur Griffiths*) . 314
Social Life (*Mary Bateson*) . . . . . 318
Postal Reform (*Mary Bateson*) . . . . . 326
Scotland (*James Colville*) . . . . . 333
Ireland (*P. W. Joyce*) . . . . . 337
Authorities, 1832–1846 . . . . . 341

## CHAPTER XXIII.

### *THE RULE OF THE MIDDLE CLASS.* 1846–1865.

Political History (*Lloyd C. Sanders*) . . . . . 343
The Army (*G. Le M. Gretton*) . . . . . 360
The Navy (*W. Laird Clowes*) . . . . . 370
The Church (*W. H. Hutton*) . . . . . 373
Literature (*H. D. Traill*) . . . . . 378
Artists of the Middle Victorian Era (*F. G. Stephens*) . 392
Philosophy and Logic (*Thomas Whittaker*) . . . . . 413
Biology (*Thomas Whittaker*) . . . . . 423
Medicine and Surgery (*D'Arcy Power*) . . . . . 440
The Mercantile Marine (*W. Laird Clowes*) . . . . 448
The Vicissitudes of Agriculture (*W. E. Bear*) . . . 468
The New Era in Economics (*J. E. Symes*) . . . . 488
Social Life (*Mary Bateson*) . . . . . 502
Scotland (*James Colville*) . . . . . 511
Ireland (*P. W. Joyce*) . . . . . 514
Authorities, 1846–1865 . . . . . 517

## CHAPTER XXIV.

*THE SUCCESSION OF THE DEMOCRACY.* 1865–1885.

PAGE

POLITICAL HISTORY (*Lloyd C. Sanders*) . . . . . 519
LAW REFORM, 1800–1885 (*F. C. Montague*) . . . . . 542
THE ARMY (*G. Le M. Gretton*) . . . . . 557
THE NAVY: (*W. Laird Clowes*) . . . . . 573
THE CHURCH (*W. H. Hutton*) . . . . . 590
LITERATURE (*H. D. Traill*) . . . . . 596
LATER VICTORIAN ARTISTS (*F. G. Stephens*) . . . . 608
DECORATIVE ART, 1800–1885 (*May Morris*) . . . . 618
MUSIC SINCE THE GEORGIAN ERA (*H. Sutherland Edwards*) . 639
ENGLISH SCHOLARSHIP SINCE 1742 (*J. E. Sandys*) . . . 647
PHILOSOPHY AND ANTHROPOLOGY (*T. Whittaker*) . . . 675
ASTRONOMY, 1846–1885 (*Agnes Clerke*) . . . . . 686
GEOLOGY AND PALÆONTOLOGY, 1846–1885 (*T. G. Bonney*) . 696
PHYSICS, 1849–1885 (*W. G. Rhodes*) . . . . . 704
CHEMISTRY AND ITS APPLICATIONS, 1846–1885 (*Robert Steele*) . 713
MEDICINE AND PUBLIC HEALTH (*D'Arcy Power*) . . . 718
ENGINEERING, 1815–1885 (*O. G. Jones*) . . . . . 729
METALLURGY AND MINING, 1846–1885 (*H. C. Jenkins*) . . 744
POTTERY AND PORCELAIN, 1815–1885 (*J. C. L. Sparkes*) . . 764
APPLICATIONS OF ELECTRICITY, 1815–1885 (*W. G. Rhodes*) . 783
THE TEXTILE INDUSTRIES, 1851–1885 (*H. Riddell*) . . . 793
AGRICULTURE (*W. E. Bear*) . . . . . 805
THE SOCIAL ECONOMY (*J. E. Symes*) . . . . . 814
EDUCATION IN ENGLAND 1807–1885 (*Mary Bateson*) . . . 830
PRISON DISCIPLINE, 1846–1885 (*Arthur Griffiths*) . . . 850
DRESS, 1840–1885 (*Mary Bateson*) . . . . . 854
SOCIAL LIFE (*Mary Bateson*) . . . . . 861
SCOTLAND (*James Colville*) . . . . . 874
IRELAND (*P. W. Joyce*) . . . . . 880
CELTIC SCHOLARSHIP (*P. W. Joyce*) . . . . . 887
BRITISH EXPLORATION, 1815–1885 . . . . . 892
GREATER BRITAIN . . . . . 927
AUTHORITIES, 1865–1885 . . . . . 933

INDEX . . . . . 937

# COLOURED PLATES.

*(Brief Notes on some of these will be found with those on the remaining Illustrations.)*


ULYSSES DERIDING POLYPHEMUS, BY J. M. W. TURNER, R.A. *Frontispiece*

THE MASSACRE OF PETERLOO, OR BRITONS STRIKE HOME, BY GEORGE CRUIKSHANK . . . *To face page* 126

UNIFORMS OF THE 86TH REGIMENT, 1842, AND THE 19TH REGIMENT, 1848 . . . . . „ „ 168

DRESS WITHOUT ART, 1836 . . . . . „ „ 318

THE VALE OF REST, BY SIR J. E. MILLAIS, BART., P.R.A. . . . . „ „ 412

THE *RIPON* LEAVING SOUTHAMPTON WITH TROOPS FOR THE CRIMEA . . . . . „ „ 458

THE TRIAL SCENE IN *HENRY VIII.*, BY F. LLOYD „ „ 504

THEIR ONLY HARVEST, BY COLIN HUNTER, A.R.A. „ „ 512

THE BATH OF PSYCHE, BY SIR FREDERIC (AFTERWARDS LORD) LEIGHTON, P.R.A. . . . „ „ 614

MINTON VASE, "THE SIREN," BY M. L. SOLON . „ „ 772

A DAME'S SCHOOL, BY THOMAS WEBSTER, R.A. . „ „ 834

# NOTES TO ILLUSTRATIONS.

VOLUME VI.


PAGE

ULYSSES DERIDING POLYPHEMUS, BY J. M. W. TURNER, R.A. *Frontispiece*

Ulysses' galley putting off at sunrise: Polyphemus above, tearing his hair and convulsed with rage. The fire on the shore is that in which Ulysses heated the staff with which he and his comrades put out the giant's eyes in his sleep.

LORD LIVERPOOL, BY JOHN HOPPNER, R.A. . . . . 3

LORD CASTLEREAGH, BY SIR T. LAWRENCE, P.R.A. . . . . 4

As he succeeded to the marquisate of Londonderry only the year before his death, he is usually known by the courtesy title which he bore during the greatest part of his career.

THE CATO STREET CONSPIRATORS SURPRISED . . . . . 5

February 3, 1820. Cruikshank visited the place in order to draw the interior, and drew the fight from a description.

BUST OF THE RIGHT HON. GEORGE CANNING, BY E. H. BAILY, R.A. . 7

NAVARINO: AN UNTOWARD EVENT . . . . . 9

Wellington, on the headland in the distance, smiling at the result. Sir E. Codrington, it was rumoured, had been encouraged to act by finding a private note from the Duke in his instructions, consisting of the words, "Go it, Ned."

FUNERAL OF THE CONSTITUTION, 1829 . . . . . 11

An ultra-Protestant view of the possible results of Catholic Emancipation.

WILLIAM IV. (a water-colour drawing by an unknown artist) . . 13

THE EMIGRATION OF OFFICERS . . . . . 17

LORD COCHRANE, AFTERWARDS EARL OF DUNDONALD . . . . 19

This painting is now in the possession of the family. A French refugee, Captain De Bérenger, whom Cochrane was about to employ as instructor in rifle practice on his own ship in 1814, personated a British aide-de-camp early in 1814, and spread the false report that Bonaparte was killed, and the allies were marching on Paris. The Funds, of course, rose at once, and fell again on the detection of the falsehood, and one of Cochrane's uncles, named Johnstone, who was apparently privy to De Bérenger's action, cleared a large sum. Cochrane, though undoubtedly innocent, was prosecuted with De Bérenger and Johnstone, imprisoned, and expelled from the Navy. He aggravated his alleged offence by escaping from prison, and, though his treatment evoked violent protests, it was not until 1832 that he was pardoned and restored to his rank. Meantime, he had aided Peru to free herself from Spain, and taken part in the Greek war of liberation.

PAGE

MODEL OF H.M.S. *ARIADNE* . . . . . 24

A sailing frigate, built in 1816, and sold out of the service in 1841. Captain Marryat, the novelist, commanded her in 1828–1830, and is believed to have supervised the construction of this model. She was 511 tons, 121 ft. long, and 31 ft. beam. She carried 20 32-pounder guns, six 18-pounders, two 9-pounders, and 20 carronades on the upper deck, and about 180 men.

MEN-OF-WAR IN PORT, BY W. ANDERSON . . . . . 25

The artist was born in 1757, and died in 1837.

MRS. ELIZABETH FRY, AFTER C. R. LESLIE, R.A. . . . . 29

A miniature from a picture by Leslie.

DR. MARTIN JOSEPH ROUTH, AFTER H. W. PICKERSGILL, R.A. . . 31

President of Magdalen College, Oxford, from 1791 till his death in 1855 at the age of 99; a great ecclesiastical scholar, and editor of works of the Fathers of the Church. The best account of him for the "general reader" is in Dean Burgon's "Lives of Twelve Good Men." This painting is in the hall at Magdalen College, Oxford.

DR. THOMAS ARNOLD, BY WILLIAM BEHNES . . . . . 32

The bust was executed in 1849. Arnold is best known as head master of Rugby from 1828 to his death in 1842, during which time he initiated a revolution in English public school education and ethics, more especially in the relation between masters and boys; but he is also of great importance as one of the founders of the Broad Church party within the Establishment (*see* text).

LORD BYRON, BY THOMAS PHILLIPS, R.A . . . . . 34

The portrait was sent by the poet to Colonel Wildman as a present, with the expressed hope that it might always hang in the large drawing room of Newstead Abbey, and it is still placed there. Newstead Abbey was sold in 1818 to Colonel Wildman, from whose trustees it passed to the family of its present owners, the Misses Webb. It was originally built in 1270, and was granted at the Dissolution to the founder of the Byron family.

PERCY BYSSHE SHELLEY, BY MISS AMELIA CURRAN . . . . . 35

Painted at Rome in 1819, three years before his death, and at the age of 27; unfinished.

JOHN KEATS, BY WILLIAM HILTON, R.A. . . . . 37

Based on a miniature by Joseph Severn, probably of 1820 or 1821.

CHARLES AND MARY LAMB, BY FRANCIS STEPHEN CAREY . . . . 39

Painted in 1834. Mary Lamb, as is well known, in a sudden fit of insanity killed her invalid mother in 1796, and her brother devoted his life to the care of her thenceforward. He, however, died in 1834, she in 1847.

THOMAS DE QUINCEY, BY SIR JOHN WATSON GORDON, R.A. . . . 40

JOHN WILSON ("CHRISTOPHER NORTH"), BY JAMES FILLANS . . 41

LEIGH HUNT, BY BENJAMIN ROBERT HAYDON . . . . . 43

SIR WALTER SCOTT'S STUDY, ABBOTSFORD . . . . . 44

SIR WALTER SCOTT, BY SIR HENRY RAEBURN, R.A. . . . . 45

PAGE

MARIA EDGEWORTH . . . . . 47

Mr. Leslie Stephen (*Dictionary of National Biography*) states that no portrait of her was ever taken, but this engraving, which is accepted by the authorities of the Department of Prints and Drawings in the British Museum, may possibly be from some unauthorised sketch.

J. M. W. TURNER, R.A., BY CHARLES TURNER . . . . . 49

A drawing in coloured chalks.

THE BAY OF BAIAE: APOLLO AND THE SIBYL, BY J. M. W. TURNER, R.A. 51

The legend is that the Sibyl of Cumae, whom Apollo loved, obtained from him the power to live as many years as the grains of sand which she held in her hands, but as she forgot to ask for perpetual youth, she wasted away till she became a mere voice. She dwelt in a cavern between Lake Avernus and this bay, one of the most beautiful in Italy or the world. The castle of Baiae is on the right, Pozzuoli (Puteoli) on the left. The picture was exhibited at the Royal Academy in 1823.

LANDSCAPE, WITH JAQUES AND THE WOUNDED STAG, BY SIR GEORGE BEAUMONT . . . . . 53

Shakespeare, "As You Like It," Act iv., Scene 2. Painted in 1819.

THE VALLEY FARM, BY JOHN CONSTABLE, R.A. . . . . 55

A farmhouse on the banks of the Stour, near East Bergholt, Suffolk. Exhibited at the Royal Academy in 1835.

LANDSCAPE WITH FIGURES, BY JOHN LINNELL . . . . . 59

"It marks the transition from his middle to his later period" (A. T. Story, *Magazine of Art*, 1893). In that year it formed part of the collection of Mr. W. Y. Baker, of Streatham Hill.

THE PASSAGE OF THE RED SEA, BY FRANCIS DANBY, R.A. . . . 61

THE GATEWAY OF THE GREAT TEMPLE, BAALBEC, BY D. ROBERTS, R.A. 63

THE PRINCIPAL CHARACTERS OF THE "MERRY WIVES OF WINDSOR," BY C. R. LESLIE, R.A. . . . . 65

The scene is not in the play, but is alluded to in Act i., Scene 2 as taking place in Page's house: "There's pippins and cheese to come." Page at the table offering a cup of sack to Slender; Falstaff joking with the merry wives, while Bardolph talks to Page's son. Sweet Anne Page sits beside her wooer: Justice Shallow and Parson Hugh at the foot of the table observe Slender admiringly. The characters are admirably conceived. (*Catalogue* of the South Kensington Collection.) The picture was exhibited at the Royal Academy in 1838.

MOUNT ST. MICHAEL, NORMANDY, BY R. P. BONINGTON . . . 67

YOUTH ON THE PROW AND PLEASURE AT THE HELM, BY WILLIAM ETTY, R.A. . . . . 69

Exhibited at the Royal Academy in 1832; Vernon Bequest.

SUNSET OFF HASTINGS, BY COPLEY FIELDING . . . . . 70

"A brilliant study of sky and clouds and light." Bequeathed with other paintings by Mrs. Carr.

THE SIGNBOARD OF THE "ROYAL OAK," BY DAVID COX . . . . 71

Painted, according to tradition, to pay the artist's bill at the village inn at Bettws-y-Coed, North Wales. The inn is now a leading hotel of a popular tourist resort, and the sign hangs inside the hall.

PAGE

ITALIAN OPERA PLAYBILL, KING'S THEATRE . . . . . 73

Boxes and stalls could only be had when not required by subscribers. Very few bills for strictly operatic performances are preserved, probably because, for the reasons mentioned in the text, not many were issued. A number of bills, however, still exist, announcing the annual benefits of the manager, "the only night of the season at playhouse prices," when the performances included comedy as well as operatic selections. In Lent oratorios, or selections from oratorios, were performed at this theatre and Drury Lane. The theatre was on the site of the present His Majesty's Theatre, in the Haymarket.

DR. JOHN PLAYFAIR, BY SIR HENRY RAEBURN, R.A. . . . . 77

SIR CHARLES LYELL, BART., F.R.S., BY GEORGE RICHMOND, R.A. . 79

A drawing in chalks. Lyell died in 1875.

ADAM SEDGWICK, BY T. PHILLIPS, R.A. . . . . 81

SIR RODERICK IMPEY MURCHISON, BY STEPHEN PEARCE . . . 83

HUGH MILLER, BY WILLIAM BONNER, R.S.A. . . . . 85

In the possession of relatives of the subject.

DAVY SAFETY LAMPS . . . . . 87

The first on the left is the original experimental lamp: the next three are improvements. In the fourth, an uncommon form, a lens is inserted. The safety depends on the cooling action of the wire gauze, which prevents the flame from igniting the explosive mixture of gas and air outside. A lamp based on the same principle, but consisting of a glass cylinder cased in wire gauze, to which air is admitted by a perforated metal ring underneath, was invented almost at the same time by George Stephenson, and is shown on the extreme right. Reservoirs of the Davy lamp are also shown.

SIR HUMPHRY DAVY, BY SIR T. LAWRENCE, P.R.A. . . . . 88

UNIVERSITY COLLEGE, GOWER STREET, LONDON . . . . . 93

Now a "constituent college" of the remodelled University of London. The front is 400 ft. long.

SIR ASTLEY COOPER, F.R.S., AFTER SIR T. LAWRENCE . . . . 94

THE JACQUARD APPARATUS . . . . . 98

A model of a loom with a Jacquard apparatus attached, its function being to raise the set of "healds" through which the warp threads pass in the order required for weaving complicated patterns. Briefly, the "griffe" or frame at the top of the machine moves up and down, and has bars to catch the hooks below it, which raise the healds or vertical threads, terminated by leaden weights, which in their turn lift the various warp threads. Which hooks shall be left in position to be thus raised is determined ultimately by the perforated cards passing over the "prism" near the top of the machine on the spectator's left. There is one card for each "pick" of weft in the pattern. At each upward movement of the griffe the prism makes a quarter turn and presents a new card to the row of spring needles opposite to it. Each card in turn is forced against these needles, some of which pass through the holes in its face into holes drilled in the prism to receive them. But the non-perforated card forces back some of the needles, and as each of the hooks has its shaft passed through a loop in the centre of the needle, the hooks not needed to be raised are pushed out of the way of being caught by the griffe. The machine is weaving a narrow ribbon.

PAGE

PORTRAIT OF J. M. JACQUARD, WOVEN BY HIS OWN MACHINE . . 99

RICHARD ROBERTS, AFTER RIPPINGILLE . . . . . 101

MAP OF PART OF OXFORDSHIRE AND BERKSHIRE IN 1797 . . 104, 105

Showing how large a part of the country round Oxford was still unenclosed. In the whole map of which this is a portion, upwards of twenty open fields are shown, besides heath or marsh lands, such as Ensham Heath and Otmoor. The last of the common fields is mentioned as surviving into the fifties by Maine, *Ancient Law*.

MODEL OF THE REV. PATRICK BELL'S REAPING MACHINE, 1826 . . 109

The cutting was done by a series of double-edged shears, the mowing blade in each pair actuated by a common rod driven by a crank worked by the travelling wheels. Cutting blades were afterwards substituted in America. The machine was propelled by two horses walking behind attached to a pole. It is said to have cut 12 acres a day.

THOMAS COKE OF HOLKHAM, BY THOMAS GAINSBOROUGH . . . 109

He was created Earl of Leicester in 1837.

HOLKHAM HALL, NORFOLK . . . . . 111

The house, two miles from Wells, was begun in 1734, and is described by Mr. Walter Rye (*Tourist's Guide to Norfolk*) as "one of the ugliest, if most commodious, in the three kingdoms." It is said to have been built after a plan by Palladio. The front is 344 ft. long. It is in a beautiful park of 3,500 acres, and contains a fine collection of paintings.

REAPING MACHINE INVENTED BY JAMES SMITH OF DEANSTON . . 113

The cutter, 5 ft. 4 in. in diameter, is seen projecting under the drum, which was rotated with it by the action of the driving wheels. The cutting and driving mechanism could be disconnected, and the former arranged to revolve either way, according as it was desired to throw the corn to the right or left. The cutter made 128 revolutions per minute when the machine was going $2\frac{3}{4}$ miles an hour. It could cut a quarter of an acre without requiring to be sharpened, and could be raised or adjusted to cut at different heights. An elaborate description is given in the *Farmer's Magazine* (Edinburgh), 1816.

THE SCALES OF JUSTICE REVERSED . . . . . 117

Published 1815. The loaf, price 1s. 6d., is outweighed by the taxes, the imps which have crushed John Bull. The landed interest dances with joy at the repeal of the property tax, shown as an imp flying away.

WILLIAM COBBETT . . . . . 120

FORTUNES MADE BY STEAM, 1825 . . . . . 123

The *Annual Register*, 1825, page 2, mentions a list of 276 companies of various sorts formed in England in 1824 and the first months of 1825, with a total capital of £174,114,050. "Poyais," on the Mosquito coast of Central America, was frequently the hunting-ground of promoters at this time. A Poyais bond for £100, part of a loan of £200,000 to "His Serene Highness Gregor I., Cacique of the Poyais Indians" whose real name was Mac Gregor, is preserved in the British Museum, and dates from 1823. An attempt was made to found a colony in that year, and failed, but its repetition was advocated as late as 1838.

PAGE

"Le Poyais" Company seems to have been what would now be called an "exploration company" concerned with the region. A caricature of 1828 also refers to it. The actual crisis came in December, 1825, when the bankers, having locked up their funds in securities they could not realise, were unable to help the speculators, who were in like case. Four London banks failed on December 5 and 6, and 67 country banks shortly afterwards. The crisis was mitigated by issue of £1 and £2 notes, and by the coinage of sovereigns.

FRANCIS PLACE, BY DANIEL MACLISE, R.A. . . . . 125

THE MASSACRE OF PETERLOO, OR BRITONS STRIKE HOME . *to face* 126

By George Cruikshank; published in 1819, and representing the charge of the Manchester Yeomanry on the unarmed populace in St. Peter's Fields, Manchester. The yeomanry are depicted as butchers armed with axes reeking with the blood of the victims.

COINS OF GEORGE IV. AND WILLIAM IV. . . . . 126, 127

The double sovereign bears the initials of the Hon. W. W. Pole, afterwards Lord Mornington, and of J. B. Merlen and Benedetto Pistrucci, who made the dies. Merlen also designed the reverse of the so-called "lion shilling." The groat, or 4d. piece, which had been discontinued except as "Maundy Money" since Charles I., was said to have been revived at the instance of Joseph Hume, M.P., the well-known financial reformer, and was therefore known as a "joey." Its issue was discontinued in 1856, as it was too near the threepenny in value, but it remained current till 1887.

QUEEN CAROLINE'S MATRIMONIAL LADDER, BY GEORGE CRUIKSHANK 128, 129

A series of drawings printed on a piece of cardboard, which folds over in the centre so as to protect them. For the most part they explain themselves. The Prince Regent's drunkenness, shown in "Qualification," the first drawing of the series, and, with his preference for other ladies, in "Alteration," was notorious. In "Declaration" he appears to be showing an empty purse to the king, who had refused him assistance unless he would marry. The subject was much more elaborately treated by the same artist in a pamphlet bearing a similar title, which exhibits, amongst other incidents, the efforts of George III. to protect the princess, the sympathy of Princess Charlotte, and the base devices resorted to by the Prince Regent to obtain evidence of his wife's unfaithfulness.

FASHIONS OF 1819, 1822, 1825, 1827 . . . . . 130, 131

These are fashion plates, supplied by dressmakers to a magazine for ladies. The morning dress, 1819, is of cambric muslin, with a lace flounce at bottom, surmounted by rows of letting-in lace, and with lace cuffs. The headdress is described as a "Cornette à la Vallière." Limerick gloves and white kid shoes completed the costume. The walking-dress of 1819 is a grey (or lavender) Kerseymere pelisse, lined with white sarsnet; the waist is described as "rather long;" the trimming, epaulettes, and cuffs are of ruby velvet; the bonnet is of the same material, intermixed with levantine, and its trimming "adds much softness to the countenance." These two costumes are for winter. The walking dress of 1822 (a spring dress) is of French grey poplin ornamented with chenille on the bust in a scroll pattern so as to form a "stomacher à l'antique." The pelisse is between a peach blossom and a red lilac lutestring in colour, tied up with bows of lutestring. The bonnet (like the skirt) is of "gros de Naples," trimmed with amber gauze. The evening dress of 1825 (autumn) is of citron-coloured silk barège, the turban of the same

PAGE

colour trimmed with beads; the bracelet studded with rubies, the ornaments pearl and turquoise. The promenade dress of October, 1827, is of Egyptian *bleu du Cape*, with leg-of-mutton sleeves; the epaulettes edged with golden satin; the bonnet of floss silk, with a colour graduated from deep orange to pale straw, and lined with pale pink satin; the strings are "*en bride*" (bridlewise); the veil of embroidered lace; the costume is completed by boots of corded silk, with a narrow fringe at top and yellow gloves. The elaboration of these dresses, as in all fashion plates, is no doubt greater than that of those usually worn.

LITERARY LADIES, BY DANIEL MACLISE, R.A. . . . . 135

From the spectator's left, and round the front of the table, the order is: Mrs. Hall, on the left of the negro servant; Letitia Elizabeth Landon, with face slightly turned away; Lady Morgan, with the dog; Mrs. Norton, at the head of the table; the Countess of Blessington by her; Miss Jane Porter, authoress of *Thaddeus of Warsaw*, stirring her coffee; Miss Harriet Martineau; Miss Mary Russell Mitford, next to Mrs. Hall. The ladies by the glass are unnamed.

REGENT STREET, WITH THE QUADRANT COLONNADE . . . . . 136

The colonnade was found to make the shops beneath it too dark for comfort, and to interfere with their trade by attracting undesirable loungers; hence its removal in 1848.

WEST LONDON IN 1832 . . . . . 137

The St. George's Cemetery still exists, though closed long ago. The houses seem hardly to go west of Edgware Road.

SPECIFICATION DRAWINGS FOR HANSOM'S CAB, 1834 . . . . . 139

Joseph Hansom, an architect, of Hinckley, Leicestershire, designed to increase the size of the wheels of carriages and bring the body nearer the ground, so as to facilitate entering or leaving it, and apply the tractive force to the best advantage. The wheels of his cab were fitted into the sides—not on to a continuous axle—and the shafts were level with their centres and with the main body of the carriage. A more novel type of vehicle had the body suspended within huge rings serving as wheels, with which it was connected by friction rollers, and it was entered sideways and through one of the wheels. A wagon with detachable body was another of Hansom's inventions.

MASTER DOGBERRY, THE PARISH WATCHMAN . . . . . 140

FRANCIS HORNER, BY SIR HENRY RAEBURN, R.A. . . . . 143

THOMAS CHALMERS, BY KENNETH MACLEAY, R.S.A. . . . . 145

A PARLIAMENTARY GAME OF SHUTTLECOCK . . . . . 147

O'Connell attempted to take his seat as M.P. for Clare on May 15, 1829. He had been elected before the passing of the Catholic Relief Act, but he claimed to substitute for the Oath of Supremacy the form prescribed by that Act. On the Speaker's ruling he withdrew, but was heard at the Bar of the House in support of his claim on May 18. He was excluded by 190 votes to 116, but was re-elected for Clare without opposition, and being thus entitled to the benefit of the Act, took his seat on February 4, 1830. The Marquis of Anglesey, who had lost his leg at Waterloo, had been Lord Lieutenant, and had been recalled in January, 1829, for writing a letter to the Romanist Archbishop of Armagh, urging that the Duke of Wellington's suggestion that the agitation for Catholic relief should be postponed ought not to be entertained, but that "all constitutional means should be used to forward the cause."

PAGE

THE NAVY IN TRANSITION . . . . . 179

The "Fantôme" was an 18-gun brig of 726 tons, designed by Sir W. Symonds, and launched about 1838, carrying 18 32-pounders and 148 officers and men. The "Himalaya" (p. 182) was built in 1853 for the P. & O. Co., but bought as a troopship during the Crimean war, and constantly used in that capacity for some twenty years afterwards, making regular passages between England and Canada while troops were stationed in the Dominion. Her speed was high for the time (13½ knots); her consumption of coal, however, would have precluded her profitable employment in the merchant service. She was 340 ft. long and 46 ft. broad.

THE NAVE, RIPON CATHEDRAL . . . . . 183

The church was a collegiate church, belonging originally to a monastery founded about 660, and containing at present work of all periods, beginning with its Saxon crypt. The nave was built in the fourteenth century, the ceiling is modern. The boundaries of the see were modified by the institution of the diocese of Wakefield in 1878.

LORD JOHN RUSSELL AND THE ECCLESIASTICAL TITLES BILL . . 185

Regarded as one of the best "hits" in the history of *Punch*. The Act was never put in force, and was repealed in 1871.

CARDINAL WISEMAN, BY THOMAS BRIGSTOCKE . . . . . 187

THE REV. JOHN KEBLE, BY GEORGE RICHMOND, R.A. (drawn in 1863) 188

CARDINAL NEWMAN, BY MISS EMMELINE DEANE . . . . . 189

Painted in 1889, the year before his death. He was born in 1801. The artist is described in Graves's *Dictionary of Artists, 1760–1893*, as having exhibited miniatures at the Royal Academy between 1879 and 1892.

THE REV. F. W. FABER . . . . . 191

JOSEPH BLANCO WHITE . . . . . 192

The grandson of an Irish merchant established in Spain, for which reason the name had been translated into Blanco. He had been educated for the priesthood, but had left it and escaped to England in 1810, and for a time had been an Anglican clergyman. He was a member of the Oriel College Common Room while studying at Oxford, but left the city soon after Whately, to whose sons he acted as tutor. He became a Unitarian in 1835.

EDWARD BOUVERIE PUSEY, D.D., BY GEORGE RICHMOND, R.A. . . 193

LITTLEMORE CHURCH, NEAR OXFORD . . . . . 195

Built under Newman's auspices, and one of the first results of the "Gothic revival" combined with the Oxford movement.

HURSLEY CHURCH AND RECTORY . . . . . 195

Keble succeeded his father as Vicar of Hursley in 1835, and held the living (with Otterbourne) till his death in 1866.

KEBLE'S RESTING PLACE, HURSLEY CHURCHYARD, HANTS . . . 197

The graves of the poet and his wife.

JOSEPH STURGE, AFTER A. RIPPINGILLE . . . . . 199

A leading member of the Society of Friends and an eminent philanthropist. His investigations of the "apprenticeship system," which

PAGE

followed the abolition of slavery in the West Indies, led to its discontinuance. He strongly supported both the anti-Corn law movement and the Chartist movement for the extension of the franchise, but eventually found it impossible to support Chartism. He was president of the Peace Society and a conspicuous citizen of Birmingham.

ALEXANDER KILHAM . . . . . 201

CONVENTION OF THE ANTI-SLAVERY SOCIETY, BY B. R. HAYDON . 205

Thomas Clarkson is speaking, his hand raised to heaven as he implores a blessing on the labours of the Congress. His daughter-in-law and her son are conspicuous on his right; next to them G. W. Alexander (with the MS.), treasurer of the Anti-Slavery Society. Samuel Gurney, W. Allen, and Stacy are in front of the treasurer. Among the 130 persons depicted are Joseph Sturge, William Forster, Sir T. F. Buxton, O'Connell, Wendell Phillips, the American abolitionist, the Rev. J. Angell James, Mrs. Lucretia Mott, a well-known American philanthropist, the Rev. Thomas Binney, a famous Non-conformist preacher, and two negro delegates from Jamaica. It is impossible to explain their positions here, but a full key to the picture is contained in the *Catalogue* of the National Portrait Gallery.

EDWARD IRVING, BY JOSEPH SLATER . . . . . 206

THE CHANCEL, CATHOLIC APOSTOLIC CHURCH, ALBURY PARK . . 207

The church was built in 1842, chiefly at the expense of Henry Drummond, M.P. In the early days of the Irvingites the six elders, with the "angel" in their midst, the seven prophets, and the seven deacons, sat in successive rows, each a step lower than that preceding it, on a platform at the upper end of the chapel. Afterwards the ritual became much more elaborate. On the Communion Table are flower vases and a tabernacle for the reserved Sacramental elements; the reservation, however, is merely for their administration to the sick, and has not the significance attributed to it by Roman Catholics and High Anglicans.

JOHN NELSON DARBY . . . . . 208

This portrait, for which the Editor has to thank Colonel Le Pelley, of St. Peter's-in-the-Wood, Guernsey, and John Hines, Esq., is taken from a drawing made by Mr. Edwin Oakley about 1891 from an old photograph. In F. W. Newman's "Phases of Faith," 1850, pp. 27–45, a striking account is given both of Groves (*see* text) and of an "Irish clergyman," who is clearly J. N. Darby, and who exercised great influence on the author for a time. Darby had injured his health by his apostolic exertions among the Wicklow peasantry, who, because of his zeal and his voluntary privations, regarded him as a saint; nevertheless he lived to visit America and New Zealand, and died at 82.

THOMAS HOOD (artist unknown) . . . . . 210

FELICIA DOROTHEA HEMANS, BY ANGUS FLETCHER . . . . 211

ALFRED TENNYSON IN 1844, BY SAMUEL LAURENCE . . . . 213

Mr. Theodore Watts, in the *Magazine of Art*, Vol. XVI., p. 42, says: "that the high quality of 'strangeness' [which Bacon regards as inseparable from the highest beauty] is found in some degree in this portrait, though its accuracy in the proportions of the features is questionable; still, it is stated to be a good likeness."

EBENEZER ELLIOTT . . . . . 215

LORD MACAULAY, BY SIR FRANCIS GRANT, P.R.A. . . . . 217

PAGE

THOMAS CARLYLE, BY SIR J. E. MILLAIS, BART., P.R.A. . . . . 219

THE ATTIC STUDY, CARLYLE HOUSE, CHELSEA . . . . . 221

The room was meant to be sound-proof. Planned in 1843, it was built in 1853 at a cost of £169, when the noises which troubled the sage had become intolerable, and a long lease of the house had been secured. Distant sounds, however, not heard before, replaced the nearer disturbances from pianos, dogs, and "demon fowls." Portraits and some of Carlyle's books adorn the walls, while his study chair and inkstand are there. Two ventilators are above the fireplace. The original window, shut off by a door, is seen through the opening.

CHARLES DICKENS IN 1855, BY ARY SCHEFFER . . . . . 225

WILLIAM HARRISON AINSWORTH, BY D. MACLISE, R.A. . . . . 228

EDWARD BULWER, LORD LYTTON, BY D. MACLISE, R.A. . . . . 229

CAPTAIN FREDERICK MARRYAT (from a drawing by D'Orsay) . . . 230

BENJAMIN DISRAELI, BY D. MACLISE, R.A. . . . . 231

A VILLAGE CHOIR, BY THOMAS WEBSTER, R.A. . . . . 233

ENTRANCE TO THE ZUYDER ZEE, TEXEL ISLAND, BY CLARKSON STANFIELD, R.A. . . . . 234

Exhibited at the Royal Academy in 1844.

PEACE AND WAR, BY SIR EDWIN LANDSEER, P.R.A. . . . . 235

Exhibited at the Royal Academy in 1846.

ST. PANCRAS CHURCH (*see* text) . . . . . 237

FONTHILL ABBEY IN 1823 . . . . . 239

The old house had been burnt down in 1755. Beckford's mansion, here shown, was built on another site. The central tower fell on December 21, 1825, destroying the whole of the western part of the abbey. The building was then sold and the ruins removed.

THE HOUSES OF PARLIAMENT . . . . . 241

Sir Charles Barry's plan was selected as the best of 97 sent in. The building covers eight acres, and contains 11 courts, 100 staircases, and 1,100 rooms. The Clock Tower is 318 ft. high, the Middle Tower 300 ft., the Victoria Tower 340 ft.

SIR GEORGE BIDDLE AIRY . . . . . 242

THE ROYAL OBSERVATORY, CAPE TOWN . . . . . 243

Erected in 1825–29, about three-and-a-half miles from the town. According to the *Encyclopædia Britannica* the work done there has included the verification and extension of the arc of meridian, measured by Lacaille, also at Capetown in 1751–1753, and a catalogue of over 12,000 stars.

DRAWINGS OF NEBULÆ, BY SIR JOHN HERSCHEL, BART. . . . . 245

Philos. Trans., 1833, Pt. 2, Figs. 35 and 87. In the first the "resolvable knots" suggested to Sir W. Herschell an absorption of the nebulous matter; the latter is one of a series apparently resolvable into star-clusters.

THE GREAT TELESCOPE, BIRR CASTLE, IRELAND . . . . . 247

The reflecting telescope, 6 ft. aperture and 54 ft. focal length, was completed in 1845 at a cost of £20,000. Its construction is due to

PAGE

William Parsons, third Earl of Rosse, who devoted a large part of his life to improving the manufacture of reflecting telescopes. This instrument was applied chiefly to the examination of nebulæ, and the important results attained included the discovery of the class of spiral nebulæ and the resolution of many nebulæ into star-clusters.

THOMAS YOUNG, BY H. P. BRIGGS, R.A. . . . . 251

MICHAEL FARADAY, F.R.S., BY THOMAS PHILLIPS, R.A. . . . . 257

SIR CHARLES WHEATSTONE, F.R.S., BY SAMUEL LAURENCE . . . 259

A drawing in chalk. Wheatstone is known also as the inventor of the stereoscope in 1838, and as the patentee, in conjunction with W. F. Cooke, of the first electric telegraph (1837). *See* p. 784

JAMES PRESCOTT JOULE, BY ALFRED GILBERT, R.A. . . . . 260

A CHEMICAL LABORATORY IN 1832 . . . . . 262

THOMAS GRAHAM, BY G. F. WATTS, R.A. . . . . 263

SAMPLES OF WHEAT GROWN AT ROTHAMSTED, HERTS . . . . . 265

The two divisions show specimens of the produce of the same plots of land under various manures for 1878 and 1899, the thirty-fifth and fifty-sixth successive years of cultivation. Taking the specimens in order from the left hand in each division, the first has been grown with farmyard manure at the rate of 14 tons per acre per annum; the next, without manure since 1839: the third, with 200 lb. of sulphate of potash, 100 lb. of sulphate of soda, 100 lb. of sulphate of magnesia, and 3½ cwt. of superphosphate; the fourth, with these minerals, but with the addition of 200 lb. ammonium salts per acre per annum: the fifth and sixth as the fourth, but with double and treble the amount of ammonium salts respectively; the seventh as the fourth, but with 550 lb. nitrate of soda per acre per annum. This quantity is reckoned equal to 400 lb. ammonium salts.

PLAN OF THE SURREY IRON RAILWAY . . . . . 269

The line, planned by Mr. W. Jessop, a prominent engineer, was originally intended to connect London with Portsmouth, but it was always a financial failure, especially when the Croydon Canal, now replaced by the L. B. & S. C. main line, was opened in 1809. Eventually the extension from Croydon to Merstham was bought by the L. B. & S. C., and the company dissolved in 1839. The line from Wandsworth to Croydon was not taken up till 1848. The waggons generally belonged to private owners, and were drawn by horses, mules, or donkeys. (*Engineer*, January 19, 1900.)

MODEL OF A SOUTH WALES BLAST FURNACE BEFORE 1850 . . . . 272

The furnace was of massive masonry, with a lining of fire-brick blocks, separated from it by a layer of sand. Four arched openings were left at the base, one for the forehearth and tapping hole, three for tuyères, which were connected by a tunnel conveying the blast main; the ore and fuel were fed in at the top, through four openings in the tunnel head. A blowing engine supplied blast to two cold-blast tuyères, through leather "goosenecks," and to the third (hot-blast) tuyère through a jointed cast-iron gooseneck. The pipe-stove heated the blast to 370° centigrade. (Catalogue *ut sup.*)

GEORGE STEPHENSON, AFTER H. P. BRIGGS, R.A. . . . . 275

PAGE

EARLY LOCOMOTIVE ENGINES . . . . . 277, 278, 279

Trevithick's tram locomotive had a single horizontal cylinder $8\frac{1}{4}$ in. diameter and 54 in. stroke, enclosed in the boiler, 6 ft. long by $4\frac{1}{2}$ ft. diameter; the whole weighed five tons in working order. It failed because the tram lines were not strong enough. The illustration is from a model made at the L. & N. W. R. works at Crewe. Blenkinsop's engine (from a photograph of a model) was made in 1812, and was the first which was financially successful. It had two cylinders (of 8 in. diameter and 20 in. stroke) set in such a way as to avoid difficulties in starting; the carrying wheels were 42 in. in diameter, and the weight five tons. "Puffing Billy," built in 1813 at Wylam, had two cylinders of 9 in. diameter and 36 in. stroke, and worked till 1862. The "Locomotion," the first engine of the Stockton and Darlington line, had two cylinders of 10 in. diameter and 24 in. stroke; the speed was eight miles per hour, and the weight, in working order, $6\frac{1}{2}$ tons. The engine stands on a model of George Stephenson's first railway bridge. The "Rocket" was built by R. Stephenson & Co. to compete at the famous locomotive trial on the Liverpool and Manchester Railway, October 6–13, 1829; she then attained 29 miles per hour, but on the opening day ran (with Huskisson after his accident) 36, and some years afterwards 53. miles per hour. She ceased running in 1844. The firebox and smokebox are inaccurately reconstructed, and the cylinders were more sharply inclined and higher, while the travelling wheels were higher. The cylinders are 8 in. diameter and 17 in. stroke; the drivers are 56 in. in diameter. The boiler pressure was 50 lb., and the whole engine and tender weighed, when working, less than $7\frac{1}{2}$ tons. The "Sanspareil," built for the same competition by T. Hackworth, of the Stockton and Darlington line, had then smaller cylinders and wooden spokes to the wheels. She worked till 1844 as a locomotive, and was then used as a colliery pumping engine till 1863. The cylinders were 7 in. diameter and 18 in. stroke, the coupled wheels 4 ft. 6 in. in diameter, and the engine, without the tender, weighed about $4\frac{3}{4}$ tons when at work. The "Novelty," by Braithwaite and Ericsson, was stoked through a central flue in the vertical part of the boiler, the air being forced into the fire by a bellows worked by the engine. She carried a water-tank below and coke in baskets upon her own truck. The two cylinders were vertical, 6 in. diameter and 12 in. stroke, the drivers 4 ft. 2 in. in diameter. The "Sanspareil" and "Novelty" both broke down at the trial. The escape flue of the latter for the gases and smoke was lengthened, as shown in the sectional plan. The "Sanspareil's" boiler had an internal return flue projecting beyond the boiler on the firegrate side and enclosed in a water-jacket, extending the heating surface.

EARLY ENGLISH ROLLING STOCK . . . . . 281

On the Liverpool and Manchester Railway, 1833.

ISAMBARD KINGDOM BRUNEL, AFTER J. C. HORSLEY, R.A . . . 282

GREAT WESTERN ENGINES . . . . . 283

The "North Star," the first engine of the line, was built in 1837 by R. Stephenson & Co., and remained in use till 1870. She had a pair of inside cylinders 16 in. diameter and 18 in. stroke, and single driving wheels 7 ft. in diameter. The wheels were not originally coupled. The "Vulcan," built in 1837 by the Vulcan Foundry Co., had single driving wheels 8 ft. in diameter, and a pair of inside cylinders 14 ft. in diameter and 16 in. stroke. The "Firefly," built in 1840, had driving wheels 7 ft. in diameter, and a pair of inside cylinders 15 in. diameter by 18 in. stroke. The "Iron Duke," built at Swindon in

PAGE

1847, had cylinders 18 in. in diameter by 24 in. in stroke, with single driving wheels 8 ft. in diameter. For many years this was the regular G.W.R. type of broad-gauge engine.

PRIMITIVE THIRD-CLASS CARRIAGE . . . . . 286

The Bodmin and Wadebridge Railway, authorised by Parliament in 1832 and opened in 1834, was intended chiefly to bring sand for manure from the Camel estuary to Bodmin. Built for £2,300 a mile, it was bought by the L. & S.W.R. during the "battle of the gauges" in 1845 to prevent its becoming part of the G.W.R. system, but it remained absolutely isolated from the English railway system till the G.W.R. opened a branch to Bodmin in 1889. One passenger train ran each way on alternate days. Since 1892 it has formed part of the L. & S.W.R. system To its long isolation the survival of this primitive form of carriage is due. The line is of interest to the student of railway archæology. (Acworth, *Railways of England*, 1900, pp. 219, 321.)

KING HUDSON'S LEVÉE . . . . . 287

In 1845 "Hudson numbered the Prince Consort among his acquaintances, and the aristocracy crowded his parties," and his admirers presented him with £16,000 as a testimonial. He was charged with issuing shares secretly, giving them away to influential persons, and with borrowing freely from some of the companies which he controlled. He was compelled, accordingly, to resign the chairmanship of several in 1849, but his collapse was less complete than is sometimes supposed, and he sat as M.P. for Sunderland (to the development of which town he largely contributed) from 1849 to 1859. He had been Mayor of York, and was instrumental in making it a railway centre. The Midland, the Eastern Counties (now the G.E.R.), and the various lines now comprised in the N.E.R., were those with which he was chiefly concerned. He died in 1871.

LONDON AND NORTH-WESTERN RAILWAY ENGINE, 1885 . . . . 289

One of Webb's compound engines; the outside cylinders are high pressure and act on the rear driving wheels, while a single low-pressure cylinder inside receives their exhaust steam, and acts on the axle of the front drivers. The reversing gear, seen passing behind the front driver, acts on the high and low pressure simultaneously, but arrangements are provided for separate adjustment, and in starting the engine "can work non-compound." The drivers are each 6 ft. 3 in in diameter.

SWING, THE RICK-BURNER . . . . . 291

From a pamphlet professing to be the autobiography of a small farmer, turned out of his farm by a new landlord to make room for a fox-covert, convicted improperly of poaching, and then driven from his cottage by the parson's demand for tithe. The picture represents the parson subsequently refusing him alms. "Swing" was the alias adopted by the rick-burners, but the hero of the pamphlet, who bears the same name, is only one by accident, and the moral of it is that the real authors of the outrages are landlords and parsons.

LORD ALTHORP, FIRST EARL SPENCER, BY SIR M. A. SHEE, P.R.A. . 293

JAMES SMITH OF DEANSTON, BY RICHARD ANSDELL, R.A. . . 295

MICHAEL SADLER, M.P., BY DANIEL MACLISE, R.A. . . . . 299

LORD ASHLEY, SEVENTH EARL OF SHAFTESBURY, AFTER J. SLATER . 301

PAGE

TRADE UNION CARDS . . . . . 304, 306

From a large collection made by Mr. and Mrs. Sidney Webb and presented to the London School of Economics.

ROBERT OWEN, AFTER W. H. BROOKE . . . . . 305

FEARGUS O'CONNOR . . . . . 309

THE FINANCIAL RECOVERY AFTER 1836 . . . . . 313

Green was a famous aeronaut.

THE LOCK-UP HOUSE, BY GEORGE CRUIKSHANK . . . . . 317

From the first edition of Charles Dickens's earliest work, "Sketches by Boz," 1836, illustrating a passage in the life of Mr. Watkins Tottle, when arrested for a debt of £33 10s. 4d. Mr. Tottle, however, does not appear in the picture. The fast and vulgar youth in front of the fireplace is explaining that he is only there because he obliged a friend by putting his name to bills, and that he expects to get out directly. The hardened debtors whom he addresses receive his assurances with incredulity, and agree that they would have a better opinion of him "if he'd say at once, in an honourable and gentlemanly manner, as he'd done everybody he possibly could."

DRESS WITHOUT ART . . . . . *to face* 318

The walking dress comprises a brown satin cape with velvet sleeves and loose hanging sleeves of satin over them, and a bonnet of cherry velvet. The examples of morning dress comprise (1) a dress of green cashmere with cambric collarette, and pink velvet puffings in the hair; (2) a green velvet dress with worked lawn cuffs and chemisette, a cap trimmed with terry velvet, an embroidered cashmere shawl, and a brown velvet bonnet with a bird of paradise plume. The vividness of the colours is noteworthy.

MR. PERKINS DISCOVERED IN THE ZOOLOGICAL GARDENS . . . . 319

From the first edition (1841) of "Comic Tales and Sketches, edited by Michael Angelo Titmarsh," Thackeray's early *nom de guerre*. The drawing illustrates "The Bedford Row Conspiracy." The attachment is objected to by the lady's relatives. She has been feeding the bears at the Zoological Gardens on a Sunday, and has been assisted by her lover, unwittingly, to jump down from the parapet in full view of a group of her aunt and cousins, with a footman and a French governess, "who had all been for two or three minutes listening to the billings and cooings of these imprudent young lovers."

CHILDREN IN 1836, BY GEORGE CRUIKSHANK . . . . . 320

From the first edition of "Sketches by Boz," appended to an article on "Hackney Coach Stands." "The smart servant girl with the pink ribbons, at No. 5, opposite, suddenly opens the street door, and four small children forthwith rush out and scream 'Coach!' with all their might."

QUEEN ADELAIDE, BY SIR W. BEECHEY, R.A. . . . . 321

THE QUEEN RECEIVING THE EUCHARIST AT HER CORONATION . . . 323

After the Lords had done homage, and the Queen had been acclaimed by the assembly, "the Archbishop of Canterbury went to the altar. The Queen followed him and, giving the Lord Chamberlain her crown to hold, knelt down at the altar: the Gospel and Epistle of the Communion Service having been read by two bishops, the Queen made her offerings . . . and received the sacrament, kneeling on her faldstool by the chair. Afterwards she put on her crown, and with

PAGE

her sceptre in her hands, took her seat again on the throne while the archbishop concluded the service." (*Annual Register*, 1838.) The coronation took place on June 28, 1838.

DUEL BETWEEN THE DUKE OF WELLINGTON AND LORD WINCHILSEA . 324

The duel took place in Battersea Fields, now Battersea Park, on March 21, 1829. Sir Henry Hardinge acted as secretary for the duke, Lord Falmouth for the Earl of Winchilsea. The duke fired first and missed, whereupon his antagonist fired in the air—an action misinterpreted in the print—and then apologised. The earl was a furious champion of Protestantism. He died in 1858.

THE HORSES' PETITION FOR THE OBSERVATION OF THE SABBATH . 325

SIR ROWLAND HILL, K.C.B., BY JOHN ALFRED VINTNER . . . 327

THE GENERAL POST OFFICE IN 1832 . . . . . 329

*PUNCH'S* ANTI-GRAHAM WAFERS . . . . . 332

On June 14, 1844, Mr. T. S. Duncombe, M.P., presented a petition from W. T. Linton, Mazzini, and others, stating that their letters had been opened. Sir James Graham, Home Secretary, admitted that he had authorised this under a statute of Queen Anne. He had really acted at the request of Lord Aberdeen, the Foreign Secretary, who wished to oblige certain foreign Governments, but he was made the scapegoat. This sheet appears to have been sold separately from *Punch*, and is referred to in the number of July 6, 1844. Attempts were made to abolish the power of opening letters, but it still exists, and is believed to have been used during the Irish troubles in 1881-1882.

THE SCENE OF THE DISRUPTION, ST. ANDREW'S CHURCH, EDINBURGH 335

The formal disruption took place on the day of opening of the General Assembly, May 18, 1843. After the usual opening ceremonies, the High Commissioner's levée and the sermon in the High Church, the assembly proceeded to St. Andrew's Church, where their sittings for business were held. The Moderator, Dr Welsh, read a long protest against the power exercised by the Civil Courts to override the Church Courts, and withdrew from the assembly, followed by the "Non-Intrusionists." The system of patronage which had led to the secession was altered in 1874.

FATHER MATHEW, BY EDWARD DANIEL LEARY . . . . . 338

SCENES FROM IRELAND DURING THE FAMINE . . . . . 339, 340

These illustrations are from sketches by Mr. James Mahoney of Cork, the special artist of the *Illustrated London News*. They appeared on February 13 and 20, 1847. The boy and girl at Cahera are searching for a potato. The degree of distress and mortality may be gathered from an extract which is appended, from a letter by Dr. Crowley of Cork stating that he and another doctor had been themselves compelled to bury a body, dead eleven days, in a kitchen garden. The hut in the old chapel yard (7 ft. by 6 ft.) originally built to shelter those who watched to prevent body-snatching, and surrounded by recent graves, served as a refuge for six members of one family named Barrett, who had been evicted from their cabin. They were suffering from malignant fever and starving. Between Clonakilty and Skibbereen the artist met "a funeral or a coffin every hundred yards."

LORD GEORGE BENTINCK . . . . . 344

PAGE

LORD PALMERSTON, BY W. BARRAUD . . . . . 345

LORD STRATFORD DE REDCLIFFE, BY G. F. WATTS, R.A. . . . 349

"GENERAL FÉVRIER" TURNED TRAITOR . . . . . 351

The Emperor Nicholas had said in reference to the war, "Russia has two generals in whom she can confide—Generals Janvier and Février" (January and February). He was taken ill of influenza on February 14, 1855, and, exposing himself unwisely at a review, died on March 2. "If anyone wants to see the effect of war upon the minds not of soldiers in the field, but of civilians at home, let him turn to John Leech's celebrated cartoon" [here shown], "brilliant in conception, admirable in execution, savage in sentiment, and odious in result" (H. W. Paul, *History of Modern England*, I. 391, *note*).

LORD LAWRENCE, BY G. F. WATTS, R.A. . . . . 354

CAWNPORE IN 1857 . . . . . 355

The magazine, which was entrusted to the guardianship of Nana Sahib, who was supposed to be friendly, was in the N.W. corner of the military lines. The entrenched camp improvised by Sir Hugh Wheeler was some six miles lower down the river to the S.E. The British retired hither before the soldiers definitely mutinied. Nana Sahib seized the magazine with its stores of artillery, besieged the camp, an utterly ineffective stronghold, for seventeen days, June 7–24, 1857, and induced the British to surrender, promising boats to convey them to Allahabad. When they had gone aboard, June 27, the boats were fired on, the men killed, and the women and children (about 80 in all) carried back and confined, with other British captives, in a small house near the Assembly Room, between the native city and the river, where they suffered from cholera, diarrhœa and dysentery, and were compelled to grind corn for the Nana's household. When Havelock defeated the Sepoy force at Cawnpore, the Nana gave orders that the prisoners, in all some 200, should be killed (July 15). The Sepoys, and butchers from the bazaar, carried out the order, and the victims, some not yet dead, were cast down a well at the back of the house (Kaye, *Sepoy War in India*, II., Bk. V., c. 2, 3).

THE SEIZURE OF THE CONFEDERATE ENVOYS . . . . . 358

The two envoys, Mason (to England) and Slidell (to France), had run the blockade at Charleston, reached Havana, and taken passage thence for St. Thomas, *en route* for Southampton, by the R.M.S. *Trent*. On November 8, in the Bahama Channel, the *Trent* was stopped by the U.S. corvette *San Jacinto* under Captain Wilkes, which, after twice firing to stop her, sent a boat aboard to demand a list of passengers, and to seize the envoys and their secretaries. This was refused, but the identity of the party was admitted. Slidell appealed to the protection of the British flag, and Captain Williams, the mail agent, formally protested against the outrage as the representative of the Queen. The *San Jacinto*, however, sent out three more boats and lay within 200 yards of the *Trent*, exposing her to a broadside. Resistance, therefore, was useless; and after a painful scene caused by the efforts of Miss Slidell to block the door of her father's cabin, the envoys and their secretaries were removed. [Account by the purser of the *Trent*, *Illustrated London News*, Nov. 6, 1861.] The envoys were confined in Fort Warren, Boston Harbour, and the seizure was received with enthusiasm in the United States. It was, however, absolutely indefensible, and after British troops had been hurried to Canada in winter, and preparations had been made for war, the envoys were quietly put aboard a British man-of-war, and brought to England in the early days of 1862.

PAGE

DAME COBDEN'S NEW PUPIL . . . . . 359

The accompanying letterpress, written in the style of a first reading book, explains that Louis Napoleon visited a nice old lady called Cob-den, who liked teach-ing lit-tle boys how to play com-merce. Louis Napoleon was not quite so ignorant as this satire suggests, as he had lived in England and had made an attempt to reduce duties in 1856. But it is clear that Free Trade in France came from above, and was strongly opposed even in the Emperor's own Cabinet. Morley, *Life of Cobden*, I.

SEBASTOPOL IN 1854, AFTER W. TELBIN . . . . . 361

THE CAVALRY CHARGE AT BALAKLAVA, OCTOBER 25, 1854 . . . 363

The British heavy cavalry had charged and driven back the Russians, who had previously captured four small redoubts with seven guns from the Turks. As the Russians were believed to be moving the guns, Lord Raglan sent a written order to Lord Lucan, commanding the Light Brigade of cavalry, to charge and check the movement. By the time the order reached Lord Lucan, the Russians had re-formed and the attackers were further flanked by artillery, riflemen, and infantry, on the hill-sides. Nevertheless Lord Lucan obeyed the order, and the Light Brigade charged right through the Russian army, sabred the gunners of the captured guns, and returned, the return being partly covered by a squadron of French chasseurs d'Afrique. *See* Kinglake, *Invasion of the Crimea*.

WINTER IN THE CRIMEA . . . . . 365

FLORENCE NIGHTINGALE . . . . . 367

Miss Nightingale had begun nursing in a Protestant sisterhood in Germany, and had applied her knowledge and power of organisation to reorganising an institution for governesses before going to the Crimea. She refused a testimonial of £50,000, and it was applied to founding a nursing institution at St. Thomas's Hospital. This bust was subscribed for in pence by the troops.

H.M.S. *WARRIOR* . . . . . 371

Now (1904) a depôt ship for torpedo boats and destroyers; 9,210 tons.

ARCHDEACON, AFTERWARDS CARDINAL, MANNING . . . . . 375

After George Richmond, R.A.

BENJAMIN JOWETT, BY GEORGE RICHMOND, R.A. . . . . 376

BISHOP COLENSO, BY SAMUEL SIDLEY . . . . . 377

ROBERT BROWNING, BY FIELD TALFOURD . . . . . 380

ELIZABETH BARRETT BROWNING, BY FIELD TALFOURD . . . 381

MATTHEW ARNOLD, BY G. F. WATTS, R.A. . . . . 382

GEORGE GROTE, BY T. STEWARDSON . . . . . 385

Painted in 1824, when he was thirty years of age.

HENRY HART MILMAN, BY G. F. WATTS, R.A. . . . . 386

Dean of St. Paul's from 1849 to his death in 1868.

W. M. THACKERAY, BY SAMUEL LAURENCE . . . . . 387

CHARLOTTE BRONTË, AFTER GEORGE RICHMOND, R.A. . . . . 389

Reproduced as the frontispiece to her Life, by Mrs. Gaskell, 1857.

PAGE

GEORGE ELIOT, BY SIR FREDERICK W. BURTON, R.H.A. (Drawn in 1865) 391

THE TINTED VENUS, BY JOHN GIBSON, R.A. . . . . 392

In the Diploma Gallery, Royal Academy. This statue, exhibited in the International Exhibition of 1862, was a replica of an uncoloured statue, but Gibson had long resided in Rome, and wrote in 1846 that he "could not bear to see a statue without colour." In that year he introduced a little colouring into a statue of Queen Victoria, executed for her: in the Tinted Venus he went further. He described it as "the most carefully laboured work I ever executed; for I wrought the forms up to the highest standard of the ideal. The expression I endeavoured to give my Venus was that spiritual elevation of character which results from purity and sweetness, combined with an air of unaffected dignity and grace. . . . I tinted the flesh like warm ivory, scarcely red, the eyes blue, the hair blond, and the net which contains the hair golden." He fell in love with the statue like Pygmalion with Galatea, and only gave her up to the patron (Mr. Preston) by whom she had been ordered four years after completion. (*Dict. of National Biography.*) The question of colouring statues was actively debated in consequence of the Venus, but the statue deserves reproduction independently of its colouring, the suitability of which could hardly be judged of except by viewing the original.

BACCHANTE AND CHILD, BY R. J. WYATT . . . . . 393

THE KNIGHTING OF HENRY ESMOND, BY A. L. EGG, R.A. . . . . 394

Exhibited at the Royal Academy in 1858. Thackeray, *History* of Henry Esmond, Book II., c. xv. "On the table was a fine sword, with a red velvet scabbard, and a beautiful chased silver handle, with a blue riband for a sword-knot. 'What is this?' says the captain, going up to look at this pretty piece. Mrs. Beatrix advanced towards it. 'Kneel down,' says she; 'we dub you our knight with this'—and she waved the sword over his head. 'My Lady Dowager hath given the sword; and I give the riband, and mamma hath sewn on the fringe.' 'Put the sword on him, Beatrice,' says her mother. 'You are our knight, Harry—our true knight. Take a mother's thanks and prayers for defending her son, my dear, dear friend.' She could say no more, and even the Dowager was affected." Lady Castlewood and the Dowager Viscountess are on the spectator's left.

MALVOLIO AFFECTING THE COUNT, BY DANIEL MACLISE, R.A. . . 395

*Twelfth Night*, Act III., scene iv.: *cf* Act II., scene v.

THE CURFEW BELL, BY SAMUEL PALMER . . . . . 397

THE COURTYARD OF THE COPTIC PATRIARCH'S HOUSE IN CAIRO. . 398

By J. F. Lewis, R.A.

THE MONK, BY WILLIAM HENRY HUNT . . . . . 399

THE BODY OF HAROLD BROUGHT TO THE CONQUEROR, BY FORD MADOX BROWN . . . . . 401

THE WHALERS, BY J. M. W. TURNER, R.A (Royal Academy, 1845) . 403

HONEYWOOD INTRODUCING THE BAILIFFS AS HIS FRIENDS . . . 405

By W. P. Frith, R.A.; from Goldsmith's comedy, *The Good-Natured Man*, Act III., scene i. Honeywood, whose good nature is leading him to squander his property, is saved by Miss Rickland (with whom he is in love) from the execution which, to give him a lesson, his uncle and guardian has secretly put into his house. Miss Rickland

PAGE

calls just as the bailiffs have arrived, and apprehends the situation, in spite of his attempt to disguise them.

A Scene on the Tummel, Perthshire, by T. Creswick, R.A. . 407

An Etching in the "Germ," by W. Holman Hunt . . . . 409

One of two etchings signed by the artist, and forming the frontispiece of the first number of the *Germ*: the other shows the lover lying in deep grief in a graveyard. The history of the *Germ* has been written by Mr. W. M. Rossetti in the preface to a facsimile reprint published in 1901.

"Ecce Ancilla Domini!" by Dante Gabriel Rossetti . . . 411

Dated March, 1850. The Annunciation: "Behold the Handmaid of the Lord!" The head of the Virgin was painted from that of the artist's sister, the poetess Christina Rossetti; Thomas Woolner, the sculptor, sat for the head of the Archangel Gabriel.

The Vale of Rest, by Sir J. E. Millais, R.A. . . . *to face* 412

Tate Gallery. "The most poetic of Millais' works." Exhibited at the Royal Academy in 1859.

William Whewell, D.D. (Master of Trinity College, Cambridge) . 417

John Stuart Mill, by G. F. Watts, R.A. . . . . 419

Henry Longueville Mansel, by William Riviere . . . . 421

Fellow of St. John's College, Oxford, Dean of St. Paul's after Milman (1849–1868), and famous as a Churchman and for his wit. A sketch of him is given by Burgon, in *Twelve Good Men*.

John Lindley, after J. H. Maguire . . . . . 424

Interior of the Great Palm House, Kew Gardens . . . 425

Thomas Henry Huxley, by the Hon. John Collier . . . 427

Downe House, Downe, Kent . . . . . 431

Charles Darwin, by the Hon. John Collier . . . . . 433

Sir Richard Owen, by H. W. Pickersgill, R.A. . . . . 437

Sir James Young Simpson . . . . . 442

Robert Liston, by John S. Stump . . . . . 443

Netley Hospital . . . . . 447

Overlooking Southampton Water; built 1858–1873, in the decorated Italian style, of purple bricks and Portland stone; over a quarter of a mile in length, covering ten acres of ground, and accommodating a thousand patients.

Ambulance Tent . . . . . 448

From the official "Manual of Ambulance Transport," by Sir G. Longmore and W. A. Morris, issued by the War Office.

The *Ariel* and *Taeping* Racing: Off the Lizard . . . . 451

In the "Tea Race" (*see* text, p. 450) for a premium of 10s. per ton offered by the principal London importers of China teas to the ships which should bring the first of the year's crop. In this year, 1866, nine ships were engaged, their tonnage varying from 686 to 853. They left Foochow at various dates from May 29 to June 6. The *Fiery Cross* left on May 29; the *Taeping*, *Ariel*, and *Serica*, May 30.

PAGE

These four were the leading ships at the finish. The *Fiery Cross* kept her lead till August 17, but was then becalmed in sight of the *Taeping*, which had caught her up on August 9. She only sighted the Isle of Wight at 10 a.m. on September 6. "At 8 a.m. on Wednesday, September 5, the *Ariel* and *Taeping*, which had lost sight of each other for seventy days, found themselves off the Lizard, running neck and neck up the Channel under every stitch of canvas that could be set, under a strong westerly wind. They appear thus in the illustration, the *Taeping* in front. During the whole day they kept their relative positions, dashing up the Channel side by side in splendid style, sometimes almost on their beam ends, the sea sweeping their decks." At daybreak next morning (Sept. 6) the pilots boarded them off Dungeness, and they raced as before to the Downs, where they took steam tugs, both ships being still neck and neck. The tugs started almost simultaneously, but the *Taeping*, having the more powerful tug, was first at Gravesend, and was docked at 9.45 p.m., half an hour before the *Ariel*, the *Serica* following at 11.30 p.m. The time was 99 days, against 106 days in 1865. The first three vessels were built by Steel & Co., Greenock; the *Serica* was iron, the *Taeping* and *Ariel* "composite"—wood with iron framing. (Abridged from the *Illustrated London News*, September 22, 1866.)

THE *GREAT WESTERN* (*see* text) . . . . . 453

THE *GREAT EASTERN* OFF THE ISLE OF WIGHT (*see* text) . . . 455

THE *CAMPANIA* . . . . . 456

620 ft. long on deck, 65·3 ft. beam; depth of hull, 43 ft.; 12,950 tons gross; 30,000 h.p. indicated; propelled by twin screws.

MODEL OF THE *WILLIAM FAWCETT* (*see* text) . . . . . 457

THE *RIPON* LEAVING SOUTHAMPTON WITH TROOPS FOR THE CRIMEA *to face* 458

With 600 rank and file of the Grenadier Guards and about 30 officers, February 23, 1854; 250 of the regiment also sailed in the screw steamer *Manilla*, and the Coldstream Guards on the same day in the *Orinoco*. (*Times*, February 23, 1854. *Annual Register*, February 22, 1854.) The steamers in the first instance went to Malta.

MODEL OF THE *BRITANNIA* . . . . . 460

Built of wood at Port Glasgow in 1840; the first "Cunarder" in the Atlantic service. She carried 115 passengers (saloon only) and 225 tons of cargo; burnt 31 to 38 tons of coal in the 24 hours, and made 8½ knots per hour. She was of 1,156 tons burden, 207 ft. long and 34 ft. beam (54½ ft. over paddle-boxes). On her maiden voyage, July, 1840, she reached Halifax from Liverpool in 11 days 4 hrs. and Boston in 14 days 8 hrs. Charles Dickens crossed in her in January, 1842, reaching Halifax after a very rough passage in 15 and Boston in 18 days. He wrote home: "I never will trust myself on the wide ocean, if it please heaven, in a steamer again." Two dangers which impressed him were that (1) the vessel must take fire if the funnel were blown overboard, because it was 40 ft. high, and at night "you see the solid fire two or three feet above its top," and (2) she rolled alarmingly as her coals lessened. He states, also, that she carried no boats, and was "full of fire and people." (*Life*, by Forster, Book IV., § iii.) He returned in a sailing ship, but reconciled himself to crossing in the Cunard liner *Cuba* twenty-five years later.

THE *CITY OF LONDON* (Inman Line: built 1863) . . . . . 461

THE FIRST *OCEANIC*, 1871 (broken up in 1902) . . . . . 464

PAGE

THE *ALASKA* . . . . . 465

6,932 tons, 10,000 indicated h.p. The Guion Line ceased running in 1894. The *Alaska*, after serving as a residence for workmen at Harland and Wolff's, was broken up about 1902.

MODEL OF THE *GREAT BRITAIN* . . . . . 467

Length between perpendiculars, 289 ft.; extreme breadth, 50½ ft.; depth, 32·5 ft.; displacement, 3,618 tons; speed, 11 knots. She carried 1,000 tons of coal and 260 passengers, and was built of iron. She ran ashore at high tide in Dundrum Bay in 1846, was floated off and sold at a heavy loss, and ran in the Australian service from 1853 to 1874. She afterwards became a coal hulk in the Falkland Islands.

EXAMPLES OF MODERN LIGHTHOUSES AND LIGHTSHIPS . . . . . 469

The Wolf Rock Lighthouse, midway between Scilly and the Lizard, was built 1860–1869 on a rock submerged 2 ft. at high water; it is 116½ ft. high, 41 ft. 8 in. diameter at the base, and 17 ft. at top. The walls are 7 ft. 9½ in. thick, decreasing to 2 ft. 3 in. The shaft contains 3,296 tons of stone (*Encycl. Brit.*). The Maplin, of which a model is shown, stands on sands.

OUTLINE MAP ILLUSTRATING ENGLISH AGRICULTURE IN 1850 . . 473

All to the east of the black line running north and south comprised the chief corn-growing districts; in these the average rental per acre of cultivated land was 30 per cent. lower than in the counties west of it, which were concerned chiefly with grazing, green crops, and dairy farming. Above the dotted line running from east to west the average wages of agricultural labour were 37 per cent. higher than below it, owing to the competition of mines and manufactories with agriculture for labour. They varied from 14s per week in the West Riding to 8s. in Essex, 7s. in Suffolk and South Wilts; the rental, from 42s. per acre in Lancashire to 17s. 6d. in South Wilts and 17s. in Durham. The produce of wheat per acre averaged 32 bushels in Norfolk and Suffolk, 21 in Dorset. The rental in the corn-growing counties averaged 23s. 8d. per acre; that of the others west of the line 31s. 5d., owing to the increased demand for meat and dairy produce. The northern counties had little more than half the pauperism of the south.

MODEL OF MCCORMICK'S REAPER . . . . . 477

The motion of the machine, by the gearing attached to the large wheel, works backward and forward a sharp blade set in slots in the projecting teeth. These support the wheat as it is cut, while the revolving frame first presses it against the blade, then throws it on the platform, whence it is raked by the attendant. A sort of projecting loop of stout iron wire and a dividing bar keep the horses and machine respectively clear of the wheat not yet cut, and the screen prevents the cut wheat from falling off on the wrong side. Cyrus H. McCormick is believed to have constructed and worked the machine in Virginia in 1831. *Catalogue* as above.

PORTABLE HORSE-POWER THRASHING MACHINE . . . . . 479

Shown at the 1851 Exhibition. The ears are carried round between the drum and its casing, and the grain knocked out of them by iron beaters attached to the drum.

J. J. MECHI . . . . . 480

PAGE OF THE VISITORS' BOOK, TIPTREE HALL . . . . . 481

SIR JOHN LAWES, BY HUBERT VON HERKOMER, R.A. . . . . 485

THE ROYAL AGRICULTURAL COLLEGE, CIRENCESTER . . . . 487

Established 1845, under the patronage of the Prince Consort; had

PAGE

in 1904 eighteen Professors and other instructors. A farm of 500 acres is attached. The front is 196 ft. in length.

SCARCITY OF CURRENCY IN 1847 . . . . . 489

Attributed, absurdly, to the restriction of note issue by private banks as well as by the Bank of England, imposed by Peel's Bank Charter Act. Much was made of this grievance by the Protectionists of the time in various circulars, etc., issued by the "National Association for the Protection of British Industry and Capital," 1849–1853.

THE REV. CHARLES KINGSLEY, BY LOWES DICKINSON . . . . . 493

THE AMERICAN CRISIS OF 1857 (*see* text) . . . . . 497

THE COTTON FAMINE: DISTRIBUTION OF CLOTHES TO OPERATIVES . 501

The money and clothing received were sent by the general committee for Manchester to the local committees, chiefly to the Manchester and Salford Provident Society, which normally combined the work of a mendicity society and a penny bank, but had little work under the latter head during the famine, and so had offered to distribute relief. It was then distributing it for nearly the whole of Manchester, through local committees. Millowners, clergy, and others were supplied with forms of application for relief, which were sent to the central committee of the society and thence to the proper local committee, which, after due inquiry, gave relief tickets, usually in the form of orders on tradesmen, soup kitchens, or clothing depôts. In the week described (November, 1862) it had spent £5,000 in clothing —about ten days' supply. Besides charitable relief through this or other (mostly religious) agencies, many millowners paid part or even the whole of the customary wages to their unoccupied millhands (*Illustrated London News*, November 29, 1862).

EDMUND KEAN, BY J. S. STUMP . . . . . 504

THE TRIAL SCENE IN *HENRY VIII.*, BY F. LLOYD . . . *to face* 504

Shakespeare, *Henry VIII.*, Act II., Scene 5. The trial takes place in a hall in Blackfriars.

SCENE FROM *OURS*, AT THE PRINCE OF WALES'S THEATRE . . . 506

Blanche Hay and Mary Netley, who have followed their (unacknowledged) lovers to the Crimea (on a yacht lent by a duchess to Lady Shendryn, the wife of another character in the play), find them housed in a log hut, "taken from the Cossacks," and are surprised, while playing at soldiers with a rifle and sword, by the entrance of one of the lovers (Chalcot), followed by the other: Mary makes a pudding, while the other ladies go out to see the fighting: a rival lover, a Russian prince, is brought in prisoner, sees his case is hopeless, and all ends happily. The scene (Act III.) is a good example of the stage conventions of the period. Mr. (afterwards Sir Squire) Bancroft, Miss Marie Wilton (Lady Bancroft), and Mr Hare helped to make the play a success. The theatre was near Tottenham Court Road.

INTERIOR OF HER MAJESTY'S THEATRE: MDLLE. RACHEL'S FAREWELL 507

By E. L. Lami. Her first season in England.

THEIR ONLY HARVEST, BY COLIN HUNTER . . . . *to face* 512

Collecting kelp. Exhibited at the Royal Academy, 1879.

DR. GUTHRIE AMONG THE STREET ARABS OF EDINBURGH . . . . 513

WILLIAM SMITH O'BRIEN . . . . . 515

From a miniature in the possession of his descendant, Dermod O'Brien, Esq., of Cahirciveen.

PAGE

THOMAS FRANCIS MEAGHER . . . . . 516

Escaped from Tasmania, 1852. Distinguished himself in the American War of Secession; spoken of among the American Irish as the General who was to reconquer Ireland, but drowned by a fall from the deck of a river steamer in 1867.

THE HON. SIR CHARLES GAVAN DUFFY, K.C.M.G. . . . . 518

DROPPING THE "SAFEGUARDS" IN THE REFORM BILL OF 1867 . . 521

*Punch*, April 20, 1867. By Sir John Tenniel. The resolutions were dropped on February 26, after a meeting of Liberal members had decided to vote for an amendment urging the Government to proceed by Bill. The "dual vote," a provision giving a second vote to everyone qualified by two years' residence and the payment of 20s. in direct taxation, was dropped April 1. The safeguard involved in "personal rating" was also eventually lost. The idea was to keep out the small occupiers who "compounded" or paid rates through their landlord, but "compounding" was abolished, and they were let in. The abolition, however, produced such inconvenience that the practice was restored in the following year, though the compounding voters did not lose their votes.

THE "LEAP IN THE DARK," AUGUST, 1867 . . . . . 523

The phrase is Lord Derby's. The Bill received the Royal Assent, August 15, 1867.

THE INJUDICIOUS BOTTLE-HOLDER, BY SIR JOHN TENNIEL . . . 527

Mr. Gladstone prompted by Palmerston's ghost. Appended is an extract from a speech delivered by him while the Conference was sitting: "I have been told that Lord Palmerston always looked on the neutralisation of the Black Sea as an arrangement that might be maintained for a limited number of years, but which it was impossible to maintain permanently." "Bottle-holders" are the "seconds" of prize-fighters. The point of the cartoon is given in the accompanying verses:—

"Then you called me a quarrelsome cuss, Bill,
But now you're on the floor,
A-holding the bottle for me, Bill,
'Gainst the Roosian Pet once more.

"Just you take a word of advice, Bill,
From one as that party knows—
The less do you show the white feather, Bill,
The louder that party crows."

Great Britain, however, could hardly go to war by herself with Russia on the question, and the other Powers would not move.

SIR STAFFORD NORTHCOTE, FIRST EARL OF IDDESLEIGH, BY EDWIN LONG, R.A. . . . . 529

"A BLAZE OF TRIUMPH": THE CYPRUS CONVENTION, 1878 . . . 531

The Cyprus Convention, signed June 4, but not published till the end of July, provided that Great Britain should hold and administer Cyprus for the Sultan and defend him against attack, he engaging to reform his Government. The island was to be given up to the Porte if Russia retired from Batoum, Ardahan, and Kars. Lord Beaconsfield's return produced an extraordinary demonstration of enthusiasm in London, but the worthlessness of Cyprus was soon discovered.

THE *TIMES* TACKING: "READY ABOUT," 1880 . . . . . 535

The *Times*, which kept up the old tradition that it represented the best public opinion of England, had been (like most people) unprepared for the sweeping Liberal victory in 1880. Its articles, just after the result became clear, laid stress on the declared intention of the Liberal leaders to maintain the chief results of their opponent's policy. On April 16 it declared that, after a general election, "the

PAGE

ARCHBISHOP TAIT, BY GEORGE RICHMOND, R.A. . . . . 592

FREDERICK DENISON MAURICE, BY SAMUEL LAURENCE . . . 591

MONUMENT TO BISHOP LIGHTFOOT, DURHAM CATHEDRAL . . . 595

An altar-tomb of veined alabaster, with an effigy by Sir Edgar Boehm, R.A., and Alfred Gilbert, R.A., in the south aisle of the choir. It was unveiled October 24, 1892.

WILLIAM HAZLITT, BY JOHN HAZLITT . . . . . 598

MARTIN FARQUHAR TUPPER . . . . . 601

ALGERNON CHARLES SWINBURNE . . . . . 603

DANTE GABRIEL ROSSETTI . . . . . 604

From a photograph by the author of "Alice in Wonderland."

CHARLES READE . . . . . 605

ROBERT LOUIS STEVENSON, BY SIR W. B. RICHMOND, R.A. . . . 607

JOHN RUSKIN, BY HUBERT VON HERKOMER, R.A. . . . . 609

HOME WITH THE TIDE, BY J. C. HOOK, R.A. . . . . 611

In the "Tate Gallery"; exhibited at the Royal Academy in 1880.

THE VAGRANTS, BY FREDERICK WALKER, A.R.A. . . . . 612

LOVE AMONG THE RUINS, BY SIR E. BURNE-JONES . . . . 613

This is as when originally painted. Subsequently the picture was destroyed by an attempt to clean it, under the mistaken belief that it was varnished. It was, however, repainted.

THE BATH OF PSYCHE, BY SIR FREDERIC (AFTERWARDS LORD) LEIGHTON, P.R.A. . . . . *to face* 614

Exhibited at the Royal Academy in 1890.

A VISIT TO ÆSCULAPIUS, BY SIR E. J. POYNTER, P.R.A. . . . 617

Exhibited at the Royal Academy in 1880. The goddess Aphrodite consulting the god of healing, as described in a verse by an Elizabethan poet:—

"In time long past, when in Diana's chase
A bramble bush prickt Venus in the foot,
Old Æsculapius helpt her heavie case
Before the hurte had taken any roote."

THE ARTIST IN HIS STUDIO, BY JAMES MCNEILL WHISTLER . . 619

ST. AUGUSTINE'S CHURCH, RAMSGATE . . . . . 624

Pugin built this church and the Gothic house adjoining in 1841, and died in the house September 14, 1852. The church was considered by him as his best work, since he was not fettered by employers. With the land it cost about £15,000, but some of the fittings were left incomplete. "Everything about it is truthful. The exterior is faced with flint, banded with courses of stone; the oak roofs are covered with ornamental Staffordshire tiles, the walls with ashlar, the chancel and Lady chapel ceilings are painted and emblazoned . . the rood screen and stalls richly carved in oak." It is to this church that Pugin refers in a passage quoted by Ruskin in the *Stones of Venice*, App. 12, and made the text for some severe, but apparently not quite justifiable, criticism. Pugin

PAGE

had a peculiar horror of Italian architecture, and of the gaudy quasi-classical decoration affected by many modern Roman Catholics. Ferrey, *Recollections of Pugin*, 1861.

THE GREAT EXHIBITION OF 1851, BY GEORGE WALLIS . . . . . 625

The scheme was a development, due to the Prince Consort, of the national exhibitions held in France, and copied in England under the auspices of the Society of Arts in 1847–48. It occupied the part of Hyde Park between Prince's Gate and the Serpentine. The building was a parallelogram, 1,851 ft. long by 456 ft. wide in the broadest part, with a transept upwards of 400 ft. long and 72 ft. wide, intersecting it at right angles in the middle. The transept roof was 108 ft. high, to give room for some elms which were enclosed in it. The design, by Mr. (afterwards Sir Joseph) Paxton, was a development of the plan of a conservatory he had built for the Duke of Devonshire at Chatsworth, where he had been gardener, and is said to have been suggested by the structure of the leaf of the great Victoria Regia water-lily. The Exhibition was open from May 1 to Oct. 11, 1851. The total number of visitors was over 6,170,000, the highest number on any one day being 109,760. The Albert Memorial, which commemorates the Exhibition as well as its chief originator, is somewhat to the west of the actual site in Hyde Park. Thornbury, *Old and New London*, V., ch. iii. The building, as is well known, was re-erected, though with considerable alterations, as the Crystal Palace at Sydenham, but part was burnt down on Dec. 30, 1866, and not restored.

OPENING BY QUEEN VICTORIA OF THE EXHIBITION OF 1851 . . 627

By H. C. Selous. In the northern half of the transept and grouped around the throne were the Royal Commissioners, Her Majesty's Ministers, the Executive Committee, the Diplomatic Corps, the Lord Mayor and Aldermen, the Commissioners from foreign Powers, the architect, the contractors, etc. On the north side of the transept were the Archbishop of Canterbury with his chaplains, the Duke of Wellington, the Marquis of Anglesey, Mr. Cobden, and others. The Queen having taken up her position on the throne the report of the Royal Commission was read, she made an appropriate reply, and the Archbishop offered up a special prayer of thanksgiving, with a petition that the Exhibition might promote peace and goodwill among men. The Hallelujah Chorus was then sung by the united choirs of the Chapels Royal, St. Paul's, and Westminster Abbey, strengthened by other singers, and a procession was then formed which traversed the Exhibition to the successive strains of an English, a French, and a German organ. The Queen then declared the exhibition open.

DRAWING OF THE CRYSTAL FOUNTAIN AT THE EXHIBITION OF 1851 . 628

The central ornament of the transept, made by Messrs. F. and C. Osler, of Birmingham. They had constructed large glass candelabra a few years previously, but this far surpassed all previous efforts. The principal dish was over 8 ft. in diameter, and weighed, before cutting, nearly a ton. Much difficulty was experienced, and much waste involved, nearly four tons of glass having been used. M. D. Wyatt, *Industrial Arts of the Nineteenth Century*.

CARPET SHOWING FALSE PRINCIPLES OF DESIGN . . . . . 631

Schools of design had been established in England in 1840 in various provincial towns, and assisted with Government grants to a total amount of £7,000 or £8,000 per annum. After the Great Exhibition of 1851 a number of articles purchased by the Government from it were placed at Marlborough House, then unoccupied,

PAGE

as the nucleus of a Museum of Design. One room was made by Mr. (afterwards Sir Henry) Cole into a "Museum of False Principles" or "Chamber of Horrors," and filled with signal examples of bad taste, of which this carpet, in brilliant colours on a chocolate ground, was one. The Marlborough House collection was transferred to the South Kensington Museum when it was opened in 1857, but the "Chamber of Horrors" had been abolished in deference to the protests of the manufacturers of the objects it contained. Sir Henry Cole, *Fifty Years of Public Life*, I., 185.

SIDEBOARD SHOWN AT THE EXHIBITION OF 1851 . . . . . 631

Carved in oak from Herefordshire: its style is described as a "happy adaptation of the English revival of antique art most generally known under the name of Elizabethan" (M. D. Wyatt, *Industrial Arts of the Nineteenth Century*, II.). It was shown by Messrs. Jackson and Graham, of London.

THE INTERIOR OF THE EXHIBITION OF 1862, BY E. WALKER . . 635

Two vast domes of glass 260 ft. high and 160 ft. in diameter—larger than the dome of St. Peter's at Rome—were connected by a nave 800 ft. long, 100 ft. high, and 80 ft. wide, lighted by windows like the clerestory of a cathedral. Laterally, the domes opened into spacious transepts, 692 ft. long and 80 ft. wide, and the nave into side aisles and galleries, roofed with glass. All this structure covered sixteen acres. Besides this there were two annexes of no architectural pretensions containing machinery. The nave was parallel to Cromwell Road; the transepts ran along Exhibition Road and Queen's Gate. The principal entrance led from Exhibition Road to the eastern dome. The floors under the domes being somewhat raised above those of the nave and transepts, striking views of the interior were afforded. The exhibition was far from attaining the success of its predecessor. The building was designed by Captain Fowke, R.E. Much of its material, rearranged, was used in the construction of the first Alexandra Palace on Muswell Hill, which was opened on May 24, 1873, but burnt down on June 9 of that year, and re-erected in 1875. Thornbury, *Old and New London*, V., chap. iii. and xxxiii. *Annual Register*, 1862.

FLORA: DESIGN FOR TAPESTRY BY SIR E. BURNE-JONES AND WILLIAM MORRIS . . . . . 637

TAPESTRY REPRESENTING A SCENE FROM THE MORTE D'ARTHUR. . 638

Executed by the Windsor Tapestry Works, after a design by H. A. Bone. It illustrates "Sir Galahad in the Castel of Maydens." Malory, "Morte d'Arthur," Book XIII., c. xiv.–xv. Sir Galahad, "whose strength was as the strength of ten, because his heart was pure," has just driven off, single-handed, a band of seven lawless knights who had held the castle and oppressed its inmates: they are seen escaping in the background. He salutes a lady, who offers him a horn of ivory, that he may blow it and announce their deliverance. An old man offers him the keys: a sister of some religious order waves the good news to someone in the distance: the watchdog, recognising Sir Galahad's instinctively as a friend, sleeps. Sir Galahad's costume is Frankish, his weapons in part Roman: the architecture Romanesque, with Roman details, such as might be appropriate to the period of the legend (fifth century A.D.), but as the romance is mediæval, some anachronisms are designedly introduced. [Abridged from a description privately printed.] This tapestry is at Aldenham House, Herts. The Windsor Tapestry Works were instituted, not as a commercial enterprise, about 1877, the Duke of Albany being President, but were closed in 1888. The workmen were French from Aubusson; the tapestries were worked from side to side, like the Arras and Morris

PAGE

tapestries, not, like the Gobelins, from top to bottom. [Information kindly furnished by Mr. H. A. Bone.]

SIR ARTHUR SULLIVAN, BY SIR J. E. MILLAIS, BART., P.R.A. . . 641

MICHAEL WILLIAM BALFE. . . . . 645

SIR CHARLES VILLIERS STANFORD, BY H. VON HERKOMER, R.A. . . 646

RICHARD PORSON, BY J. J. KIRKBY . . . . . 649

SAMUEL PARR, BY GEORGE ROMNEY . . . . . 651

BENJAMIN HALL KENNEDY, BY W. W. OULESS, R.A. . . . . 655

WILLIAM HEPWORTH THOMPSON, BY H. VON HERKOMER, R.A. . . 657

Master of Trinity College, Cambridge, 1866–1886; well known for his exceptional powers of sarcasm. When he saw this portrait, he is reported to have said, "Is it possible that I regard all mankind with such contempt?"

FIRST FRAGMENT OF THE HYPERIDES MS. . . . . 659

Papyrus cviii. Bought from a dealer in 1847 at Thebes, Egypt; probably from a tomb. All the fragments of the speeches of Hyperides or Hypereides, the Attic orator, of which others were discovered in 1856, are on papyrus and among the oldest Greek MSS. extant. Their discovery was the first of a series of similar discoveries of other early papyrus MSS., of which the long lost treatise by Aristotle on the Constitution of Athens, the mimes of Herondas, and the poems of Bacchylides, all revealed to the modern world in the last ten years of the nineteenth century, are the most notable. These fragments are probably of the first or second century B.C., and are mounted in glazed frames.

THOMAS GAISFORD, DEAN OF CHRIST CHURCH . . . 661

WILLIAM MITFORD, AFTER H. EDRIDGE . . . . . 664

BISHOP CONNOP THIRLWALL . . . . . 665

THE ELGIN MARBLES, PART OF THE FRIEZE OF THE PARTHENON . 667

The "Elgin marbles" consist of the frieze and other sculptures from the Parthenon, and of various sculptures and antiquities from Attica and other parts of Hellas. Thomas Bruce, seventh Earl of Elgin (1766–1841), when appointed Ambassador to Turkey in 1800, decided to take Italian artists and modellers to copy the ancient sculptures then within the Turkish dominions. In 1801 he obtained leave not only to erect scaffolding round the Parthenon, but to take away any pieces of stone with inscriptions or figures, and in 1803 he began to exercise this power, seeing that the marbles were running great risk of injury. He was savagely attacked by Byron ("The Curse of Minerva") and others, and the value of his collection questioned. He therefore silenced such criticism by opening it to the public. In 1816, on the recommendation of a House of Commons Committee, it was bought by the nation for £35,000; he had spent in all about £74,000.

WINGED MAN-HEADED LION FROM THE PALACE OF ASSUR-NASIR-PAL. 669

About 12 ft. high and 12 ft. long, forming, with a companion, a portal to a chamber round which were sculptured figures of deities or priests. Obtained by Sir A. H. Layard in 1849. Assur-nasir-pal reigned 885–860 B.C. The head indicates knowledge, the body strength, the wings ubiquity. Layard, *Nineveh* (ed. 1867), p. 53.

PAGE

Sir William Jones, by Sir Joshua Reynolds, P.R.A. . . . 673

John Mitchell Kemble, by T. Woolner, R.A. . . . . 674

Professor Alexander Bain, by Sir George Reid, P.R.S.A. . . 676

Herbert Spencer . . . . . 677

Dr. E. B. Tylor . . . . . 681

George Henry Lewes . . . . . 682

Prof. W. K. Clifford, by the Hon. John Collier . . . . 683

Dr. James Martineau, by A. E. Emslie, A.R.W.S. . . . . 685

The Moon Photographed by Warren de la Rue . . . . . 687

De la Rue's methods were described by him to the British Association in 1859, and also in the "British Journal of Photography" of 1859 and 1860. Proctor, *The Moon*, p. 156.

The Rivabellosa Expedition . . . . . 688

Described by Mr. Warren de La Rue, its leader, in the Bakerian Lecture, *Philos. Trans.* 1862. The expedition joined others, sent out by the British Government in H.M.S. *Himalaya*. Rivabellosa is seventy miles from Bilbao.

Dr. Schuster's Photograph of the Eclipsed Sun . . . . . 689

Taken at Sohag, Egypt, May 17, 1882. The results are described in *Philos. Trans.*, Vol. 175 (1884). "The body of the moon appears . . . bordered by a well-defined black line, out of which the prominences are seen to rise." A "luminous streak" was seen during totality, and revealed by the photograph as a comet. In recognition of the hospitality of the then Khedive Tewfik it was called after him, though it was "not expected to be heard of any more." In view of the history of Egypt from 1882 onwards, this is a fine stroke of unconscious humour.

Sir Norman Lockyer . . . . . 690

Observatory of Sir William Huggins, K.C.B., Tulse Hill, Norwood . . . . . 691

Founded in 1856: used for obtaining spectroscopic observations, and photographs of the stellar spectra, the solar corona, etc. An account by the founder is given in the *Nineteenth Century*, June, 1897, and in his *Atlas of Stellar Space*. The observatory was built on pillars to get a freer horizon, and consisted of a 12-ft. dome, replaced in 1870 by an 18-ft. drum.

Spectrum of the Sun and Great Nebula in Orion . . . 693

Described in Sir W. Huggins's *Atlas of Stellar Space*, Plate III. The lines marked H, with a Greek character appended, are hydrogen lines; that marked 3727 represents an unknown substance, "nebulum"; that marked 3868 may possibly be helium.

The Orion Nebula, Photographed by Dr. Common (Jan. 30, 1883) 694

Possibly a star-cluster in process of development from a nebula—a process of which the Pleiades forms a more advanced example. Clerke, *The System of the Stars*, p. 281. This photograph had 37 minutes' exposure in the focus of a 3-ft. silver-on-glass mirror. *Monthly Notices* of the Royal Astronomical Society, xliii., p. 255.

Photograph of the Comet of September, 1882 (*see* text, p. 693) 695

PAGE

ICHTHYOSAURUS TENUIROSTRIS . . . . . 697

Fitted together about 1881 by Mr. A. Gillett, from rejected slabs in a quarry near Street, Somerset; a nearly perfect skeleton.

ERRATIC BLOCK AT SEAMER STATION, YORKSHIRE . . . 699

Such boulders of rock brought by glaciers from the Lake region—especially granite from Shap Fell, basalt, limestone—are found in many places in Yorkshire, commonly in excavations. A number have been collected and placed in the grounds of York Museum. Seamer is near Scarborough.

WILLIAM PENGELLY, F.R.S., BY A. S. COPE . . . . . 701

INTERIOR OF THE GEOLOGICAL MUSEUM, JERMYN STREET . . . 705

The School of Mines is in the same building, which occupies an area of 70 ft. by 153 ft., and was specially constructed at a cost of £30,000. The museum, on the second floor, has galleries above. *See* text, p. 86.

PROFESSOR JOHN TYNDALL . . . . . 707

PROFESSOR JAMES CLERK MAXWELL . . . . . 709

LORD KELVIN, G.C.V.O., F.R.S., BY W. W. OULESS, R.A. . . . 712

A VERY EARLY PHOTOGRAPH . . . . . 716

"The Ladder"; reproduced from "The Pencil of Nature," a work, now rare, by W. H. Fox Talbot, M.P., a country gentleman and considerable mathematician, scholar, and Assyriologist, who, while sketching with the aid of a camera in 1833, thought of attempting to find some means of fixing the sun-picture. He experimented for five years with nitrate and chloride of silver, incidentally discovering that the picture could be fixed for a time with iodide of silver, and following for part of the time the lines of Wedgwood (son of the potter) and Davy, who had produced evanescent sun-pictures in 1802. In 1838 he found Daguerre was working independently (using glass-plates) to a like result. His photographs were produced on paper "negatives," whence the "positives" were printed. In 1840 he improved his process. He states that he could get small portraits in one or two seconds. His pictures were known as "calotypes" or "talbotypes."

MODEL OF SULPHURIC ACID PLANT . . . . . 717

Pyrites, crushed in the machine in front, are burnt in the eighteen furnaces placed back to back on the left: the gases disengaged pass into the smaller or Glover tower, where they are treated with nitrated vitriol from the taller or Guy Lussac tower; then they pass into the chambers behind it, where they are treated with steam, and sulphuric acid is produced. The residual gases from the third chamber pass into the tall tower, where any nitrogen oxides remaining are absorbed by strong acid from the Glover's tower. The acids are pumped up: the pumps and the boiler which supplies the steam are shown in the model. (Abridged from *Catalogue* of Machinery, South Kensington.)

LORD LISTER . . . . . 721

A LUNATIC EARLY IN THE NINETEENTH CENTURY . . . . 724

A sketch from the life in Bethlehem Hospital ("Bedlam") by G. Arnold, A.R.A., exhibited to a Select Committee of the House of Commons on Madhouses in 1815, and etched by George Cruikshank. The patient had been fastened to an upright iron bar by chains 12 in. long for many years.

PAGE

EARLSWOOD ASYLUM, REIGATE—COBBLING . . . . . 725

The Asylum was instituted in 1847, opened in 1853, incorporated by Royal Charter in 1862, and considerably enlarged in 1876. It is a charitable institution, but takes paying patients.

WARD IN GUY'S HOSPITAL . . . . . 727

The "Martha" Ward. A comparison with the illustration of one of the wards of the original hospital (1725), given in Vol. V., p. 67, will convey some idea of the progress in hospital management in a century and a half.

TYPES OF STEAM BOILERS . . . . . 731, 732, 733, 735

The waggon boiler, p. 731, was introduced by Watt between 1780 and 1790, to get a greater heating surface than was afforded by the "haystack" type used with the Newcomen engine (Vol. V., p. 426). The heated gases from the furnace passed along the bottom to the end, then back by one side flue and forward again by the other. This type was given up about 1850, its shape not permitting very high pressures of steam. The "Lancashire" boilers (p. 733) are a development of the "Cornish," the conception of which is attributed to Trevithick, and which has a single internal furnace flue with external (return) flues in the brickwork; the "Lancashire" has double internal flues. The "Richardson" and "Cochran" types are vertical boilers, in which the tubular arrangement is adopted, to increase the heating surface. The "Galloway" (*see* text, p. 733) is a development of the "Lancashire," the two flues uniting in one, which is strengthened by water tubes, which also greatly increase the heating power. The "tubulous" boiler is an early example of the "Babcock and Wilcox" water-tube boiler, now adopted in a greatly modified form for naval purposes. The water is heated in tubes and passes to a drum, where the steam is separated from it, the balance of the water passing back to the tubes, so that its heat is not lost, and the temperature tends to uniformity throughout.

LENOIR'S GAS ENGINE . . . . . 737

This, patented in 1860, was the first practically successful gas engine. The explosions of mixed gas and air alternately on each side of the pistons which drive the engine were produced in it by electric sparks from Bunsen batteries attached, the necessary contacts being made and broken by the rotation of contact pieces on an insulating disc on the crank shaft. In later types the explosion was caused by a gas flame.

FAMOUS BRIDGES OF THE NINETEENTH CENTURY . . . . . 739

Telford's Menai suspension bridge, built 1819–1825, is 570 yards long, and the roadway is 100 ft. above high water. The Britannia Bridge consists of two independent wrought iron tubular beams, each 1,511 ft. long and 15 ft. wide, 100 ft. above high water: the Britannia Tower in the centre, 230 ft. high, stands on a rock in the middle of the channel. The tubes were built on the shore of the Straits, then floated to the bridge, and raised by hydraulic pressure to their places. This method of construction was adopted to prevent interruption to the navigation by scaffolding or arches.

THE FORTH BRIDGE . . . . . 741

The towers are 360 ft. in height, the height above high water 151½ ft., the total length 1½ miles, the main spans 1,700 ft. The bridge, the largest in the world, took five years (1884–1889) to build, and contains 120,000 cubic yards of masonry and 41,500 tons of steel. *See* text, p. 740. It was opened March 4, 1890.

PAGE

THE VRYNWY DAM . . . . . 742

1,255 ft. long and 60 ft. high, makes an artificial lake (on the site of a village), whence water is supplied to Liverpool by a two-mile tunnel and an aqueduct 67 miles long.

THE MANCHESTER SHIP CANAL AT EASTHAM . . . . . 743

This canal (constructed 1887–1894), from Eastham on the Mersey to Manchester, is 35½ miles long and averages 172 ft. wide on the surface. Besides the locks at Eastham, there are four sets between them and Manchester, overcoming a total rise of 60 ft. 6 in.

BESSEMER STEEL WORKS . . . . . 746, 747

An improved plant, saving much labour and dating from about 1891. The molten cast iron is taken up in a truck by a lift and poured into the converter, where air is blown through it (*see* text, p. 749), and thence into a ladle carried by a circular crane, whence again it is emptied into a ladle carried by the central crane of the casting pit. From this it is run into the ingot moulds, but the ingots, as soon as sufficiently set, are lifted by a crane into a soaking pit, or closed firebrick chamber, the invention of Mr. Gjers, introduced about 1882. In this the ingot can cool more equally throughout, so that it can be rolled at once instead of requiring re-working as previously. (*Catalogue ut sup.*)

SIEMENS'S STEEL APPARATUS . . . . . 748

An apparatus for the "direct" production of steel by heating a mixture of iron ore and fine coal in a chamber containing reducing gases. This chamber, shown on the spectator's left, consists of a lined wrought iron cylinder which can be slowly rotated. Currents of gas and air are passed into this and form a flame in its interior. The ore is thus smelted, and the rotation of the chamber causes the grains of iron to collect into a "bloom." This is carried to the gas reverberatory furnace, seen on the extreme left, and is there converted into steel. According to Mr. Andrew Carnegie, in his paper in the *Nineteenth Century—A Review of Progress* (1901), the Siemens open-hearth process tends to predominate over the Bessemer.

THE *THERMOPYLÆ* . . . . . 749

Built in Aberdeen 1869. Made the "record" passage to Australia, and various other "record" trips. Disputes with the *Sir Lancelot* the honour of being the fastest sailing vessel ever built. *See* text, p. 450.

WOMEN AND CHILDREN IN THE COAL MINES . . . . . 750, 751

These drawings have official authority, being given in Blue Books of 1842 (reports of Commissions). They created a great sensation in the country. The cases are taken from Lancashire, Yorkshire, and Wales.

DIAGRAM OF HARTLEY COLLIERY . . . . . 754

*Illustrated London News*, February 1, 1862. For ventilating purposes, the single shaft was divided by a partition, as shown. The engine beam missed the cage in its fall, but the timber and *débris* dislodged, killed some of the men and blocked the shaft. The water rose in the pit and forced up the carbonic acid gas. The men, who were working in the "low main" (the third cross-gallery from the top), climbed up a wire rope ladder in the shaft on the extreme left, and were found suffocated in the "yard seam."

MODEL SHOWING METHODS OF GETTING COAL . . . . . 759

Showing two forms of the "board and pillar" and two of the "long wall" method. The arrows show air currents. *See* text, p. 757.

PAGE

MODEL OF A COLLIERY VENTILATING FURNACE . . . . . 761

From South Wales: date, 1856. A short, brick-lined shaft connects it with the "upcast" shaft, and the lining is separated from it, for coolness, by air-passages. It consumes its own smoke.

MODEL OF CORNISH TIN STAMPS . . . . . 764

These stamps (from Carn Brea, Redruth), of white cast iron with wooden stems, were arranged in sets of three, and worked by a steam engine, which lifted each stamp-head five times during each of its revolutions: the ore was broken into lumps of about two cubic inches and dumped into hoppers leading into stout oak boxes ("cofers") under the stamps. The bed was formed of hard quartz between masonry. The particles into which the lumps were broken were washed out by a stream of water through perforated copper plates in front of the boxes.

PIERCED WORCESTER WARE . . . . . 767

"A hint from the wonderful pierced work of the Chinese." Burton, *English Porcelain*.

A POTTER'S WHEEL . . . . . 768

The type has been generally in use for the last hundred years. The large wheel is turned by an attendant, who thus rapidly rotates the vertical spindle carrying the wood block on which the potter shapes his clay. The speed, of course, can be varied to suit his requirements.

VIEWS AT THE ROYAL PORCELAIN WORKS, WORCESTER . . . 769

A TILE PRESS . . . . . 771

MINTON VASE: "THE SIREN," BY M. L. SOLON . . . *to face* 772

"Pâte-sur-pâte," *i.e.* painting in a thin mixture of clay and water upon a clay ground. The process is described in Burton, *English Porcelain*, p. 183.

"AUTUMN": A FIGURE IN PARIAN, MODELLED BY CARRIER-BELEUSE 775

TWISTED THROWN PIECES IN COLOURED SALT GLAZE STONEWARE . 778

THE REREDOS, ST. MARY'S CHURCH, LAMBETH . . . . . 779

By George Tinworth. Mr. Edmund Gosse (*The Works of George Tinworth*, 1883) describes him as "the only artist who has contrived to express in his art the actual religious sentiment of the lower middle class in England," and compares him in some respects, especially his humour, to such Puritans as Bunyan and Quarles. It may be noted that he owed his training in art to the writer of this section, his natural aptitude having been sternly repressed by his father, a wheelwright, while his Puritan bent came from his mother (Gosse, *op. cit.*). The figures in the smaller panels are Moses, Peter, Paul, and Elijah; the archbishops are those specially connected with the adjacent Archiepiscopal Palace—Hubert Walter and Bancroft on the right, Tenison and Secker on the left.

BRICKMAKING MACHINE . . . . . 780

A vertical pugmill, containing a number of revolving inclined blades, which work the clay and force it downwards. It is then pushed out by a piston, worked from below, so as to form a continuous bar, which is cut into bricks by a swing-frame of wires, worked by hand.

FRONT OF THE BIRKBECK BANK (SOUTHAMPTON BUILDINGS) . . 783

PAGE

FIVE-NEEDLE INSTRUMENT OF COOKE AND WHEATSTONE . . . 785

An early instrument, patented in 1837, and used for some time on the railways between Euston and Chalk Farm and Paddington and West Drayton. By pressing two keys on a keyboard of 12, placed in front of the instrument, two of the needles were deflected, and the point of intersection of their centre lines on the dial indicated the letter to be read. Twenty letters could thus be signalled, the other six being indicated by other letters or combinations of letters; the numerals were indicated by using one needle at a time.

SECTIONS OF THE SECOND AND THIRD ATLANTIC CABLES . . . 787

Shore ends and deep-sea portions. One of the latter was recovered from a depth of 11,700 ft. (over two miles). The weight of the deep-sea portions was 1.52 tons per mile. The shore ends are protected by galvanised iron wires, and in the 1866 cable also by a layer of tarred hemp.

SIEMENS'S ORIGINAL DYNAMO . . . . . 791

Described by Sir C. W. Siemens to the Royal Society, Feb., 1867.

ST. CATHERINE'S LIGHTHOUSE, ISLE OF WIGHT . . . . . 792

Total height, 86 ft.; completed in 1840, and electrically lighted since May, 1888.

RING SPINNING MACHINE; COMBING MACHINE . . . . . 795

Full accounts of these machines, with sectional drawings, will be found in Morris and Wilkinson, *The Elements of Cotton Spinning* (Longmans, 1897), pp. 146, 254.

COTTON PREPARATION IN INDIA . . . . . 799

SILK-THROWING MACHINE . . . . . 804

For winding and twisting the raw silk. It twists the two threads wound on the two bobbins carried in the frame, and stops automatically should the thread break.

THE BAD SEASON, 1879 . . . . . 809

THE LONGFORD CHEESE FACTORY, DERBYSHIRE . . . . . 811

MODEL OF A LEVER HORSE HOE, 1851 . . . . . 812

Shown at the 1851 Exhibition by Messrs. R. Garrett & Sons; intended for scarifying the soil between the rows of young plants. The hoes and the gauge are accurately adjustable, so that the former can be pitched to suit the sowing, and are arranged irregularly to lessen the chance of tearing up the crop. They can be elevated clear of the ground all together. The frame is carried on swinging links to correct irregularities in the movements of the horse.

CLOD-CRUSHER, 1845 . . . . . 813

The travelling wheels serve to move the machine over hard roads, and can be lifted clear of the earth when on the field.

SOME SYMPATHISERS WITH LABOUR . . . . . 821

SOME LABOUR LEADERS . . . . . 823

Mr. J. M. Ludlow was Registrar of Friendly Societies from 1874 to 1891; Mr. Mundella was President of the Board of Trade; Mr. Thomas Hughes, once M.P. for Lambeth and a County Court Judge, was best known as the author of "Tom Brown's School Days"; Professor Fawcett as an economist, M.P. and Postmaster-General, whose energy enabled him to triumph over the blindness

PAGE

accidentally inflicted by his father's gun at the outset of his career; George Odger (1820–1877) was an active Trade Unionist and Reform Leaguer of 1866, and frequently attempted, but without success, to enter Parliament as a Labour member; Alexander Macdonald, who began his career as a boy in a coal-pit, was the earliest Labour M.P. (1874). Mr. Burt, M.P., and Mr. George Howell, ex-M.P. and a well-known writer on labour questions, need no further description.

SAMUEL PLIMSOLL, M.P. . . . . 825

UNIVERSITY COLLEGE, NOTTINGHAM . . . . . 829

Opened in 1891; cost £70,000. The spire is 120 ft. high: the front is adorned by statues of Shakespeare, Milton, Bacon, Locke, and Cuvier.

JOSEPH LANCASTER, BY JOHN HAZLITT . . . . . 832

MADRAS COLLEGE, ST. ANDREWS . . . . . 833

Founded out of a bequest of £60,000 by Dr. Bell (*see* text) and recently placed under a new scheme. For Dr. Bell, *see* also Prof. Meiklejohn, *An Old Educational Reformer*, 1881. He left £120,000 for the promotion of his system of education, of which half was allotted to St. Andrews, his native place, the other half being divided in sums of £10,000 between Glasgow, Edinburgh, Leith, Aberdeen, Inverness, and the Royal Naval School (now Eltham College), London. The old burgh and grammar schools were merged in the new foundation, whose members have gained a large proportion of the University honours at St. Andrews.

A DAME'S SCHOOL, BY T. WEBSTER, R.A. (Royal Academy, 1845) *to face* 834

A VILLAGE SCHOOL IN 1840, BY HABLÔT K. BROWNE . . . . . 835

THE ELEMENTARY EDUCATION ACT, 1870 (the "religious difficulty") . 839

DR. ANDREW BELL (*see* note above, on p. 833) . . . . . 840

SCHOOL-ROOM, WESTMINSTER SCHOOL, 1883 . . . . . 841

Re-founded by Queen Elizabeth in 1560. Nearly all the forms were accommodated in this one room as recently as 1877. It was originally the dormitory of the monks of the Abbey, but has been largely rebuilt, and the windows are modern.

GYMNASIUM, NORTH LONDON COLLEGIATE SCHOOL FOR GIRLS . . 844

The school was started by Mrs. and Miss Buss as a private school in Camden Street, N.W., converted into a permanent institution in 1871, and endowed in 1894. *See* Ridley, *Frances Mary Buss*.

NEWNHAM COLLEGE, CAMBRIDGE (from designs by Basil Champneys) . 847

BALLIOL COLLEGE, OXFORD (SOUTH FRONT) . . . . . 848

Built in 1868 from designs by Waterhouse. It is notable for the boldness of its outline and the variety of detail.

CHAPEL OF EXETER COLLEGE, OXFORD . . . . . 849

An imitation, by Sir Gilbert Scott, of the Sainte-Chapelle at Paris; regarded by the author of Murray's Handbook (*ed.* 1872) as "the most remarkable modern edifice in Oxford." The painted windows are by Clayton and Bell.

QUADRANGLE, KEBLE COLLEGE, OXFORD . . . . . 851

The college was founded in 1868 as a memorial to the author of "The Christian Year," and was intended to afford a college education at a

PAGE

moderate cost, and to train its members in the doctrine and discipline of the Church of England. About £15,000 was spent at the outset on the site, buildings, and in initial expenses, and a superb chapel was subsequently given by Mr. A. Gibbs. Further buildings have since been added. The material is brick, and the buildings were designed by Butterfield. They were opened in October, 1870.

TRINITY COLLEGE, OXFORD . . . . . 851

Showing the chapel and the new buildings, erected 1881–1883.

CONVICTS AT WORK IN THE DARTMOOR QUARRIES . . . . 855

The prison was built in 1806 to provide accommodation for French prisoners of war. In 1899 there were about 800 convicts in it.

DRESS AND COIFFURE, 1845 . . . . . 856

Showing the tight-lacing, the ringlets over the ears, and the bandeaux referred to in the text, pp. 856, 859.

DRESS IN 1860 AND IN 1875 . . . . . 857

The 1860 dress exhibits flounces, linen undersleeves, and the large bonnet of the period; that of 1875 the characteristic overskirt, smart hats and toques, and a developed form of the chignon.

DRESS AND THE LADY, 1856 . . . . . 858

LADY IN SHAWL, 1853 . . . . . 858

A *THE DANSANTE*, 1815. . . . . 859

A very literal interpretation of the term.

EARLY VICTORIAN BONNETS . . . . . 859

A DOLLY VARDEN FAREWELL KISS, BY G. DU MAURIER . . . 860

The Dolly Varden hat was even more characteristic than the dress. Both, of course, were named after Dickens's heroine in *Barnaby Rudge*.

AN IMPARTIAL STATEMENT IN BLACK AND WHITE, BY G. DU MAURIER 861

With the second title—"Æsthetic Lady and Woman of Fashion, Woman of Fashion and Æsthetic Lady," showing the dependence of the dress on the wearer. The æsthetic lady on the left, it need hardly be said, was the more usual type.

THE DRUNKARD'S CHILDREN, BY GEORGE CRUIKSHANK . . . 863

Cruikshank's teetotal enthusiasm was due to his family history (*cf.* Vol. V., p. 780). This series is a sequel to the better known "Bottle." The children, neglected by their drunken parents, find their way to the public-house; the boy learns to drink and gamble, the girl drifts to a low dancing saloon; the boy is arrested at a low lodging-house for robbery, is tried and sentenced to transportation, dies, being weakened by his dissipated life; and the girl, being left alone, commits suicide. These drawings were published in 1848.

THE TRUE LOVERS' KNOT (on the Cobden Treaty) . . . . 867

TINDER BOXES, FLINTS AND STEELS . . . . . 869

The flint was held in the left hand and struck by a piece of steel that fitted over the knuckles of the right. Particles of metal, so heated as to burn, were knocked off, fell on the tinder and lighted it. By blowing on the tinder it was made to burn sufficiently to ignite sulphur, with which the wooden slips then known as matches were tipped. The lid smothered the tinder when the light had been

PAGE

obtained, and was fitted with a socket so as to serve as a candlestick. The tinder was prepared by scorching rag.

THE FIRST FARMHOUSE JAM FACTORY, 1873 . . . . . 871

At Histon, Cambridge; adapted from a barn, and interesting as a stage in the development of the "factory system" from "domestic manufacture" in the jam trade. It was the germ of the large establishments of Messrs. Chivers & Sons.

TOYNBEE HALL, WHITECHAPEL . . . . . 873

Founded in connection with St. Jude's Church, Whitechapel, and in memory of Arnold Toynbee (*see* text); a "University settlement" at which young graduates reside, much as in college, pursuing (if they wish) their own professional studies and at the same time obtaining personal experience of social problems by intercourse with the working classes.

GLASGOW UNIVERSITY . . . . . 875

Founded in 1450: the old buildings, begun in 1632, were sold to the Glasgow Union Railway Company in 1864, having been condemned some years earlier as unsuitable. These buildings, on the banks of the Kelvin, were designed by Sir Gilbert Scott, the style being described as domestic Early English, with Scoto-Flemish features of a later date. They are 532 ft. long; the tower, with the spire, is 278 ft. high. (Groome, *Ordnance Gazetteer of Scotland.*)

THE TAY BRIDGE AFTER THE DISASTER OF 1879 . . . . . 877

A hurricane of unparalleled violence struck the bridge as a train for Dundee was crossing it on Sunday evening, December 28, 1879, and all the passengers, numbering about 70, were lost. It was not proved conclusively whether the train was blown off the rails and carried the bridge with it or ran into a chasm already made. The Wreck Commissioner's official report condemned the design and material of the bridge.

CROFTERS' HOME IN ISLAY, 1787 . . . . . 879

CROFTERS' HOME IN SKYE, 1885 . . . . . 880

The Isles have made no great advance in the standard of comfort.

AFTER THE EXPLOSION IN CLERKENWELL, 1867 (Corporation Lane) . 883

An attempt was made on December 13, 1867, to blow down the wall of the House of Detention abutting on Corporation Lane at the time the prisoners took exercise in the yard (about 4 p.m.) by exploding a powder barrel against it. The Fenian prisoners, Burke and Casey, were not rescued, but four persons were killed, about 50 injured, and many houses blown down or damaged. Several persons were arrested, but none was convicted.

VENUS ATTIRED BY THE GRACES, 1869 . . . . . 884

The Christian Graces. Faith (Lord Westbury), Hope (Earl Grey), and Charity (Lord Cairns). (*Punch*, July 10, 1869.) Lord Westbury and Lord Grey favoured "concurrent endowment." Lord Cairns carried an amendment postponing for a year (till January 1, 1872) the date at which disestablishment should take effect.

HIBERNIA WATCHING FOR THE GOOD SHIP LAND ACT, 1881 . 885

*Punch*, July 30, 1881.

CHARLES STEWART PARNELL . . . . . 886

PAGE

SCENE OF THE PHŒNIX PARK MURDERS . . . . . 887

Lord Frederick Cavendish, who was driving on a car to the Viceregal Lodge, overtook Mr Burke, dismissed the car and joined him. Near the Phœnix monument they were overtaken by a car with four men, who jumped down, stabbed them, and drove off The murderers did not know the new Chief Secretary by sight, and killed him merely because he was in company with Mr. Burke, the Under-Secretary, who was the real object of attack. The scuffle was actually seen by a passer-by at some distance and by Earl Spencer, the Viceroy, from a window of the Viceregal Lodge, but they did not recognise the victims, and thought it was merely horseplay among roughs. Five men, members of a secret society, the "Invincibles," were hanged for the murder and fifteen sent to penal servitude. James Carey, who turned Queen's evidence, was smuggled out of the country, but was followed and murdered by an emissary of the society, named O'Donnell, on a Cape mail steamer, July 29, 1883.

EUGENE O'CURRY . . . . . 889

PAGE FROM "THE YELLOW BOOK OF LECAN" . . . . . 891

A MS. written at the end of the fourteenth century: "a series of disconnected collectanea, the stock-in-trade of some professional shanachy" (*cf.* text, Vol. III., p. 406). It contains various legends, some Irish, others connected with Biblical personages, homilies, moral tales, maxims, etc. The drawing given is a plan of the House of Midchuairt, or banqueting-hall of King Cormac's palace at Tara Hill. In the centre are marked three fireplaces (*Teine*), a vat (*dabach*, of mead?), a candle and a lamp; then an open space, with a door (marked) opening into it. The compartments represent seats, the station of the sitters and the portions of meat allotted to them being specified. At the top of the diagram (the back of the hall) are the servants (distributors, cupbearers, herdsmen); at the right and left sides of the door respectively are stationed "the king's doorkeepers, and backs (of the animal) for them; the king's fools, and chines for them." The first four divisions on the outside row to the left, beginning from the top, accommodate "horsemen and stewards, chines for them: harpers and tympanists, pig's shoulder for them; Brehons, steaks for them: professor of literature and Tanist professor, chines for them." Augurs and druids, engravers, shoemakers, trumpeters, and builders are also among the diners. A similar diagram, with different details, is preserved in the Book of Glendalough. The total number of diners is 116. The description of the king's seat implies that it was placed three-fourths of the way up the hall, *i.e.* between two of the fireplaces. Petrie, *Antiquities of Tara Hill, Dublin*, 1839; also in *Proceedings of Royal Irish Academy*, Vol. XVIII.: Joyce, *Social History of Ancient Ireland*, II., c. xxi.

PASSAGE THROUGH THE ICE, 1818 . . . . . 893

Lat. 70° 44′ N.; from a drawing by Captain Sir John Ross. The previous winter had been unusually severe, and many whalers were beset in the ice. The expedition was only absent six months.

RELICS OF SIR JOHN FRANKLIN, GREENWICH HOSPITAL . . 896, 897

Of the relics figured on p. 827, 1 are weapons and implements made by the Eskimo from iron and wood obtained from Franklin's ships; 2, is a pemmican canister marked E (*Erebus*); 3, powder and shot flasks; 4, goggles, to protect the eyes from the glare caused by the ice; 5, sextant found at Ross Cairn, Point Victory, in 1859, by Capt. McClintock; 6, dipping needle; 7, boat sheet block and hook.

PAGE

THE COUNTRIES ROUND THE NORTH POLE AS KNOWN IN 1875 . . 899

Since 1875, the date of this map, the principal additions to knowledge have been those of the expedition under Captain Nares (*see* text), the crossing of Greenland by Nansen and the exploration of its northern part by Peary (1892, 1895). Nansen's exploration north of Franz Josef Land and his penetration to the furthest point north yet reached (86° 13′ 6″ N. lat., N.E. of Franz Josef Land). Mr. Jackson's exploration of Franz Josef Land, Sir Martin Conway's of Spitzbergen, and the exploration by the Duke of Abruzzi's expedition, a sledge party from which got further north than Nansen by about twenty miles (86° 33′ N.).

ANTARCTIC ICE, 1874 . . . . . 900

CHRISTMAS HARBOUR, KERGUELEN ISLAND . . . . . 901

The island, 85 miles in length and 79 in extreme breadth, is volcanic in formation, and much indented by fiords. It is visited only by whale and seal hunters, and appears not to have been fully explored (Moseley, *Notes by a Naturalist on the "Challenger,"* chap. 8).

VIEW OF THE SOURCE OF THE RIVER TIGRIS . . . . . 907

The region contains the traditional site of the Garden of Eden, the River Hiddekel being identified with the Tigris, the Pison and Gihon with the Halys and Araxes respectively, and Havilah with the ancient Colchis (Chesney, *op. cit.* in text).

SIR RICHARD F. BURTON, K.C.M.G., IN PILGRIM'S DRESS . . . 909

DAVID LIVINGSTONE . . . . . 911

LIEUT.-COLONEL JAMES GRANT . . . . . 912

CAPTAIN JOHN HANNING SPEKE . . . . . 913

LAKE NYASSA, FROM THE ISLAND OF LIKOMA . . . . . 915

CENTRAL AFRICA AS KNOWN IN 1815 AND IN 1890 . . . 916, 917

MOUNT SARMIENTO . . . . . 921

Explored in December, 1898, by Sir Martin Conway; *see* his "Aconcagua and Tierra del Fuego," 1902.

MAPS OF AUSTRALIA, 1830 AND 1889 . . . . . 923, 925

Showing the progress of exploration as described in the text.

BREADFRUIT TREE, KI ISLAND, THE MOLUCCAS . . . . . 926

LAVA STREAM, KILAUEA, HAWAII . . . . . 927

THE ROYAL NAVAL DEPÔT, SYDNEY HARBOUR . . . . . 931

PART OF THE COLONIAL PROCESSION AT THE QUEEN'S JUBILEE, 1897. 932

Just after it had crossed London Bridge to the City. The carriage, of which a portion is shown, is followed by Natal Mounted Troops, Rhodesian Horse, Cyprus Zaptiehs, and other representatives of the mounted forces of the Crown Colonies. The procession, with its variety of representatives of the different colonies and possessions of the Empire—Canadian, Australian, and South African troops, Haussas from West Africa and Nigeria, native police from Hong Kong, the Straits Settlements, and Borneo—was one of the most impressive features of the celebration.

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# PREFATORY NOTE.

16838

With the closing years of the nineteenth century the intellectual and industrial achievements of the British nation come to be so multifarious that they can hardly be dealt with in the same book as the social and political history. Science becomes cosmopolitan, so that no description of British achievements can exclude those of Europe or America. Processes in the great staple trades of the United Kingdom become far too specialised for the ordinary reader; a multitude of tertiary and miscellaneous industries defy classification and even enumeration; railways, merchant shipping, the machinery of commerce, deserve a volume apiece; and the various developments in the social structure, such as trade unionism and co-operation, have called forth whole libraries of their own. Literature and art can fare little better at the hands of the student of society as a whole. But the political history, too, becomes far more complicated and difficult to set forth. An immense change is set up by the advent of popular government with the machinery of agitation first developed in the Anti-Corn Law campaign and the Chartist movement. Our foreign relations become more complex as diplomacy tends to supersede warfare: the Irish problem in the nineteenth century is repeatedly more threatening than it has been since the sixteenth, and in the opening years of the twentieth it still awaits its solution. The Established Church sees the consummation of three great movements, partially anticipated in the previous century; the Roman Catholics and the Nonconformists escape from their disabilities, but at the end of the century are further from absolute religious equality than they seemed to be when its last quarter began. The army and navy have undergone more than one transformation; the State, and still more the municipalities, have multiplied their administrative functions during the period. The Colonies at the

beginning of the period were (if we put aside the West Indies) little more than tolerated appendages of the Mother Country; now the greatest of them have expanded into self-governing nations, with power to aid her in her difficulties, to influence her policy, to offer their experience for the solution of her social problems, and with the will to combine, by means as yet undevised, into a world-wide Empire of a type never previously approached in human history.

In preparing the original edition of this work in 1891–96 it was thought by Mr. Traill and myself that the defeat of Mr. Gladstone's Home Rule policy in 1886, following on the general election and the extension of the franchise in 1885, marked that year as the end of an epoch in English history. It is not impossible that the close of the longest reign will hereafter be regarded as a better conclusion: but as regards this new edition it is open to the objection that it would have required the transformation of the present volume and its expansion into two. Even since 1885, the local government of the three kingdoms has been revolutionised, new modes of power have been introduced into industry and domestic life, shipbuilding has taken a fresh start and is possibly on the eve of new and notable developments, legal reform has made considerable progress, labour questions have reached a critical stage, and it is only since the Jubilee of 1897 and the South African War that the British people has come to realise the full significance of the Empire. At the present moment we seem to be in a time of political, industrial, and scientific transition, the significance of which we, who live in it, cannot apprehend. It has been thought best, therefore, to stop at the date originally fixed for closing the work, but where the text had ceased to be adequate to present conditions subsequent changes have been indicated either in it (with the help of some of the contributors) or in bracketed footnotes, for which the Editor alone is responsible. There has been no attempt, however, to describe in detail developments posterior to 1885. But the Rev. W. H. Hutton has rewritten the last two of his sections on the church; and as regards the closing section on our Colonial Empire, what was written in 1896 had become obviously antiquated since the war in South Africa, and this has therefore been condensed and re-written.

Of the illustrations, I may repeat what was said in the first volume: that the problem has been to find those which had a direct reference to the text. It need not be said that this has required an immense amount of research, and that the difficulty in some cases has been to find any illustration at all, in others to choose among an embarrassing multitude. In the earlier volumes, valuable help was obtained from experts; but in the last three, with the exception of the sections on Art in the present volume, I have suggested the great majority of the subjects myself. And I think it may fairly be claimed by those who are responsible for their final incorporation in the text that they give additional point and emphasis to its statements, and that none of them are merely decorative, or only remotely relevant to the accompanying narration.

In concluding his labours on the original Edition, Mr. Traill recorded our obligations to Mr. A. Hassall, Principal Fairbairn, and Professors Cunningham and Bonney, for their helpful advice in its preparation. As regards this final volume of the illustrated Edition, our sincere thanks are due to the owners and custodians of numerous portraits and other objects of great historical interest for their generous permission to reproduce them in this work. As in previous volumes, the source of each illustration is noted underneath it; but special acknowledgments are due to His Grace the Archbishop of Canterbury, the Earl of Durham, the Earl of Leicester, Earl Spencer, the Earl of Rosse, Lord Aldenham, Lady Chermside, Lord Hawkesbury, the Lords Commissioners of the Admiralty, the Right Hon. Sir Evelyn Ashley, Sir William Huggins, K.C.B., O.M., Sir David Gill, K.C.M.G., the Dean of Westminster, the Hon. John Collier, Professor Hubert Von Herkomer, A. E. Emslie, W. W. Ouless, R.A., and Colonel Le Pelley, Dr. A. Schuster, Dr. H. Woodward, F.R.S., Messrs. Dermod O'Brien, W. C. Hazlitt, Douglas W. Freshfield, A. D. Hall, Herbert A. Bone, Lowes Dickinson, J. H. Gurney, C. J. Guthrie, C. L. Reade, J. M. Ludlow, H. M. Marshall, Thomas Burt, M.P., George Howell, Sidney Webb, Dr. Sophie Bryant, Miss Miller, and Mrs. Mansel. We are also indebted to the Elder Brethren of Trinity House, the Dean and Governing Body of Christ Church, Oxford, the Heads and Fellows of Trinity College, Emmanuel College, St. John's

College, and Magdalene College, Cambridge, and of Balliol College, Oxford; to the Principal and University Court, Aberdeen, and the Headmaster of Westminster School; to numerous societies and institutions for much valuable assistance, the Royal Society, the Royal Astronomical Society, the Royal Horticultural Society, the Linnean Society, the Royal United Service Institution, the Royal College of Surgeons, Edinburgh, the Royal Irish Academy, the Torquay Natural History Society, and the Lawes Agricultural Trust. Our thanks are also due to the Treasurers of the Middle Temple, the Worshipful Company of Clothworkers, the Corporations of Dublin, Manchester, King's Lynn, and Salford; to the London Trades Council and the authorities at the Challenger Office, Edinburgh: the Museum, Newport; St. Cuthbert's College, Ushaw; Brompton Oratory; the Working Men's College, Toynbee Hall, Guy's Hospital, the London School of Economics and Political Science, the South London Art Gallery, and the Wandsworth Public Library; Sir W. G. A. Armstrong, Whitworth & Co., Limited, Messrs. Morris & Co., Messrs. F. and C. Osler, Messrs. George Thompson & Co., Messrs. Doulton & Co., Limited, Mr. Edward Stanford, Messrs. Dobson and Barlow, the Peninsular and Oriental Steam Navigation Company, the Cunard Company, Messrs. Ismay, Imrie & Co., the officials of the London and South-Western and the London and North-Western Railways, the proprietors of *Punch* and the *Illustrated London News*. Special thanks are due to the officials of the British Museum, the Board of Education, the Victoria and Albert Museum, the National Gallery, the National Portrait Gallery, and the Scottish National Portrait Gallery for constant help and service in the preparation of this and the preceding volumes. Finally, I must express my great indebtedness to the staff of the Art Department of Messrs. Cassell & Co., and for the Notes on Illustrations, as in previous volumes, to the catalogue of the Naval and Engineering Collections at South Kensington and to the "Dictionary of National Biography."

J. S. Mann.

*August* 5, 1904.

9-12 30

# SOCIAL ENGLAND

## CHAPTER XXI.

### PEACE, RETRENCHMENT, AND REFORM. 1815-1832.

H. D. TRAILL. Introductory.

WITH the Battle of Waterloo and the peace which followed it the nineteenth century may be said, for Europe at any rate, to have begun. Its first fifteen years belong of right to that preceding century which, at its death, had left behind it an "estate" of unsettled political problems and fierce international contentions, which it took half a generation to wind up. The exhausting and almost unbroken war of twenty years, which Waterloo brought to a close, must be regarded as one long trial of the great issue raised by the French Jacobins, and taken up by their suppressor and successor—one continuous prosecution of that far-reaching quarrel into which all the European States, from the greatest to the smallest, were successively drawn, and which for our own country became in its later stages an actual fight for existence. During the years of this life-and-death struggle, when all the energies of the nation were concentrated on the work of self-preservation, social progress was of necessity to a great extent arrested. Trade and industry were immensely but variously influenced, the disastrous effects of the long war upon them in some of their forms being but ill-balanced by the artificially inflated prosperity which it imparted to others (pp. 112, 116). Political movements which had seemed almost within measurable distance of success when the excesses of the French Revolution let loose a flood of reaction against them in the last years of the eighteenth century, were held in check by the great European conflict for well-nigh twenty years. In religion, in science, and even to some extent in literature

itself, the effect of these formidable preoccupations is to be noticed, and their consequences, direct and indirect, are noticeable even after the pressure is removed. England had still to fight her way through the desperate financial complications that the war had left behind it, and to grapple with the almost revolutionary disorders in which they in their turn were prolific before her various faculties again had time and freedom to expand. It was not, indeed, till the century had run a third of its course that England, and Europe generally, entered upon that extraordinary career of political and social, industrial and commercial, and above all, of scientific, development of which the end is not yet, but which has already secured for it a unique place among the ages of the world.

LLOYD C. SANDERS. Political History.

THE Liverpool Ministry was ill-fitted to deal with the "condition-of-England" questions that thrust themselves forward after the Peace of 1815. It contained some ability, but little harmony, and its finance was wretched. The export trade recovered but slowly, owing to the exhaustion of the Continent. At home there ensued a series of disastrous harvests, together with the stress of foreign competition. Mr. Vansittart, the Chancellor of the Exchequer, made no attempt to cut down expenditure, beyond a slight reduction of the Civil List. The agricultural interest forced through a Corn Law which prohibited importation until the price of wheat reached 80s. a quarter (p. 118).

Disturbances at Home.

The working classes promptly took to rioting. In the eastern counties the labourers burnt ricks (p. 119); in the manufacturing towns the artisans destroyed machinery. Some dangerous revolutionists made use of the Spencean Philanthropists (p. 120) to organise a conspiracy for establishing a Committee of Public Safety and seizing the Tower of London. Their meeting at Spa Fields was, however, an egregious failure. After a stone had been hurled at the Regent's carriage, when he went to open Parliament, the Government proceeded in 1817 to suspend the Habeas Corpus Act. Nevertheless the north was alive with discontent. The Blanketeers set forth from Manchester to march on London, and "Captain" Brandreth raised an insurrection at Derby. Two years later an attempt to

1832]

suppress a Radical meeting in St Peter's Field, near Manchester, was bungled by the magistracy, and the troops, riding over the people, caused the so-called Peterloo Massacre. The Government, which had already failed to secure the conviction of Hone, the bookseller, for his political parodies, proceeded to pass the Six Acts. They aimed at suppressing sedition, alike on

LORD LIVERPOOL, BY JOHN HOPPNER, R.A.
*(By permission of the Right Hon. F. J. S. Foljambe)*

the platform, the press, and in the field, and Lord Sidmouth, the Home Secretary, rigidly enforced them.

The Holy Alliance.

Abroad, the military powers, under the leadership of the sentimental Czar Alexander, had formed the Holy Alliance, nominally to support Christian principles of government, but really to keep under popular movements. It received little support from Lord Castlereagh, the Foreign Secretary, and thus England stood more or less isolated.

Death of George III.

The long reign came to an end at last, for on January 29th, 1820, George III. died. The dynasty was undoubtedly unpopular with the middle and lower classes. Princess Charlotte, the Regent's daughter and the hope of the nation, had died in

1817, after what promised to be a happy marriage with Prince Leopold of Saxe-Coburg. On the other hand, of the various members of the royal family who had rushed into alliances, the Duke of Kent had become the father of Queen Victoria, born May 24th, 1819.

The new reign began with the detection of a plot to murder

*Photo: Walker & Cockerell.*

LORD CASTLEREAGH, SECOND MARQUESS OF LONDONDERRY, BY SIR T. LAWRENCE, P.R.A.

(*National Portrait Gallery.*)

**The Cato Street Plot.**

ministers at a Cabinet dinner and seize the Bank of England and the Tower. Its leader was Thistlewood, who had been at the back of the Spa Fields affair, and it met in Cato Street (now John Street), Edgware Road. As usual the Home Office was warned by an informer, and the ringleaders were duly hanged.

**Queen Caroline.**

The return of Queen Caroline, from whom the king had been separated since 1814, brought fresh discredit on the royal

THE CATO STREET CONSPIRATORS SURPRISED, Feb. 23rd, 1820.

*(From the contemporary drawing by George Cruikshank.)*

house. Coming back from abroad to assert her rights, she was met by a Bill, introduced by Lord Liverpool, under pressure from George IV., for the dissolution of her marriage. The evidence produced before the House of Lords certainly convicted her of astounding disregard for propriety; but it had no effect whatever on the London mob, which persisted in regarding her as a deeply wronged heroine. The majorities for the Bill dwindled, and it was dropped after its third reading in the Peers. Soon afterwards, however, her hold on public sympathy began to relax; a foolish attempt to force her way into Westminster Abbey on the occasion of the king's coronation completed the popular disillusionment, and in August she died. The crowd rioted round her coffin as it was being conveyed through London. The king went on his way to Ireland, where, to the disgust of the Whigs, he was received with boisterous loyalty. In the following year he showed to more credit in Edinburgh. But he could not face London, and soon shut himself up in the Brighton Pavilion, a prey to his whims and his attendants.

**The Ministry Strengthened.**

Warned by recent events, Lord Liverpool resolved to reconstruct his Ministry. In 1822 Lord Sidmouth retired, and was succeeded by Robert Peel, who had already made his mark as Chairman of the Bullion Committee, which recommended the resumption of cash payments. Later in the year Lord Castlereagh (now Marquis of Londonderry) committed suicide on the eve of his intended departure for the Congress of Verona. He was replaced by Canning, and two of Canning's friends also joined the Government: Robinson as Chancellor of the Exchequer, and Huskisson as President of the Board of Trade.

**Canning and the Holy Alliance.**

Canning promptly tried a fall with the Holy Alliance, which had determined to put down constitutionalism in Spain. He sent the Duke of Wellington to Verona with instructions to protest against any interference. The duke went so far as to withdraw from the Congress, but a French army was nevertheless despatched across the Pyrenees. With supreme adroitness Canning converted the rebuff into a diplomatic triumph. He hastened to recognise the revolted Spanish colonies, or—to use his own rhetoric—he "called the new world into existence to redress the balance of the old." And when Spain desired to suppress the constitutional cause in Portugal, Canning intervened with decision. Within four days an expedition was

despatched to plant the British flag on "the well-known heights of Lisbon," and Ferdinand VII. withdrew the troops that he sent in support of the absolutist Dom Miguel. As a matter of fact Canning's policy was less of a departure from Lord Castlereagh's than is generally supposed, but he acted more freely, because he was unhampered by private friendships with Metternich and other Continental statesmen.

The Marquis of Hastings, Governor-General from 1814 to 1823, had enlarged the frontiers of India. Driven by frontier raids to invade Nepaul, the British troops defeated the Goorkhas and wrung from them hill-districts, which included the healthy station of Simla. In Central India the marauding Pindaris were chastised, and in 1817 and the following year Lord Hastings tried conclusions with their sympathisers, the Mahrattas: Holkar, the leading spirit in the confederacy, was heavily defeated at Mehidpore, its nominal head, the Peishwa, was deposed and his dominions annexed. The submission of the Rajputs rounded off the Presidency of Bombay. On Hastings' successor, Lord Amherst (1823–28), fell the responsibility of resisting Burmese aggression. The war was tedious, and the troops were decimated by the climate. In 1826, however, the king surrendered by treaty Assam, and the districts of Arakan and Tennaserim. Lord William Bentinck's Governor-Generalship (1828–35) was unmarked by military expeditions on a large scale. He suppressed Suttee, however; exterminated the Thugs; and appointed a Commission which, with Macaulay as its President, codified the Indian law.

*Photo: Walker & Cockerell.*
RT. HON. GEORGE CANNING, M.P.,
BY E. H. BAILY, R.A.
After a bust by Joseph Nollekens, R.A.
(*National Portrait Gallery.*)

India.

At home the new element in the Government was doing excellent work. The Home Secretary set himself to reform and consolidate the criminal law, abolishing the penalty of capital punishment for nearly a hundred felonies. Robinson set aside the sinking fund, reduced the interest on the war

Domestic Reforms.

debt, and, after the commercial crisis of 1825 had tried credit very severely, he countenanced the creation of joint-stock banks, and prohibited the issue of £1 and £2 notes (p. 122). His financial policy, which, though within limits, proved a distinct advance on Vansittart's was supposed to be largely influenced by Mr. Huskisson. That able man modified the Navigation Acts by carrying a Reciprocity of Duties Bill, whereby foreign nations were offered an equality of trade with this country. He also lowered the duties on silk and wool, and so gave a considerable impetus to both industries.

The Liverpool Ministry had gone far to recover its popularity with the country. But the "pigtail Tories" were infinitely disgusted, and even went so far as to oppose Mr. Canning's friends at the polls. On the 7th of February, 1827, Lord Liverpool had a stroke of apoplexy, and with his death the divisions of the party became past healing.

**The Canning and Goderich Ministries.**

There were two possible Prime Ministers, Peel and Canning, but neither would serve under the other. To his great disgust, the king was compelled to send for Canning, whom he disliked on personal grounds. Peel and the Duke of Wellington promptly resigned their offices, though Catholic Emancipation was still to remain an open question. Canning got together a Ministry of his personal friends, and he was afterwards joined by Lord Lansdowne and other Whigs. He was badly beaten in the Lords on a Bill for graduating the corn duties, and on August 8th died, his last days having been embittered by paltry strife. Robinson, become Lord Goderich, attempted to carry on the rickety Government. Its members, however, quarrelled violently, and at last that "transient and embarrassed phantom," its nominal chief, went to the king and resigned in tears. In January, 1828, the Duke of Wellington formed a Ministry, with Peel as his Home Secretary, and a Canningite element, including Huskisson, Lamb, Palmerston, and Grant.

**Navarino.**

The duke had promptly to deal with the Eastern question in a very acute shape. The Greeks had revolted against Turkey, and their cause aroused genuine, if exaggerated, sympathy in this country. It appeared hopeless, however, when Mehemet Ali, the Viceroy of Egypt, sent an army under his son, Ibrahim Pasha, to help the Sultan. Russia and England had long been striving after a point of union, and, after the

1832]

Porte had refused an armistice, Lord Dudley, the Foreign Secretary of the Canning Ministry, had signed the Treaty of London, whereby the two Powers and France pledged themselves to enforce a cessation of hostilities. Vague orders were

NAVARINO—AN UNTOWARD EVENT.
(*From a contemporary satirical print.*)

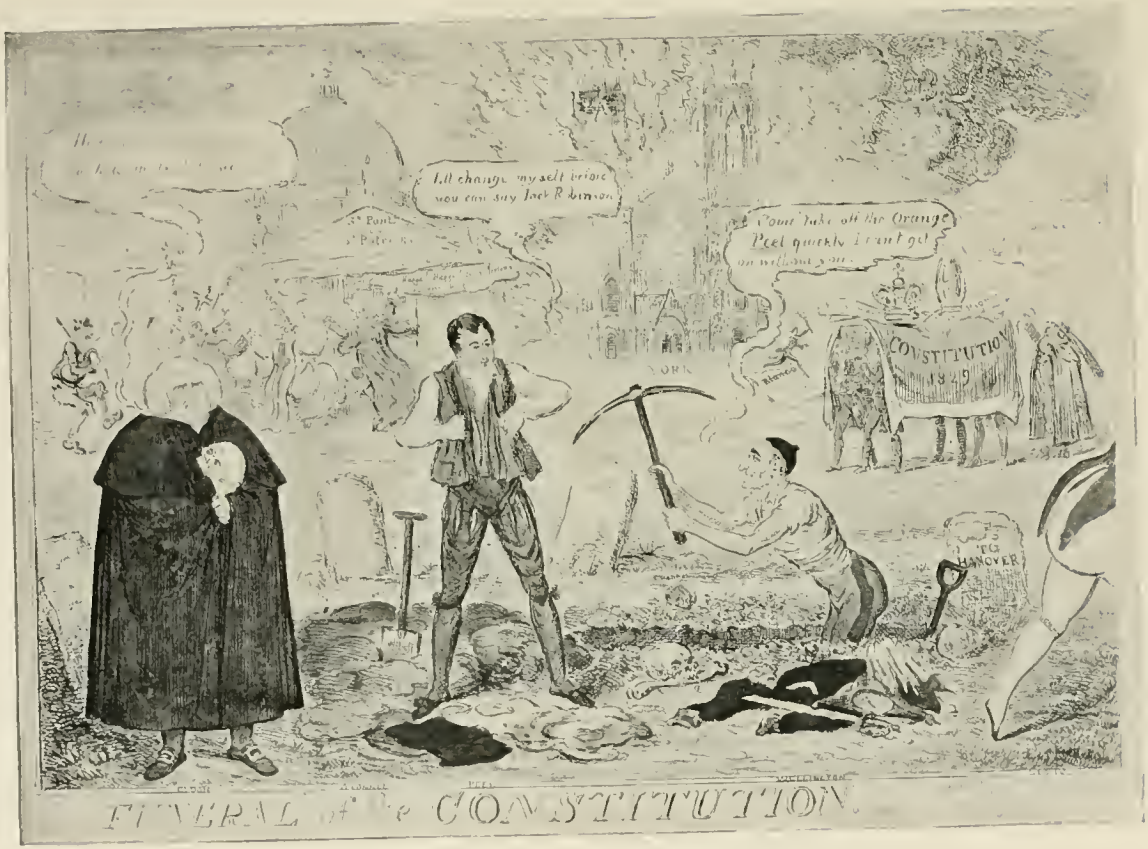
sent to Admiral Codrington, who commanded the Mediterranean Squadron, and he remained at anchor while Ibrahim Pasha ravaged the Morea. When, however, the Turkish fleet attempted to issue from Navarino Bay and fired on the British flag-ship, the allies replied in good earnest, and gained a complete victory (October 27th, 1827). The duke was far from relishing this "untoward event," as it was styled in the Queen's Speech. Instead of sending the British fleet to

Constantinople, he allowed Russia to prosecute the war alone, and wring the Treaty of Adrianople from the Turks. The limits of independent Greece were fixed by the allies in London, and they were far from satisfying Philhellenist aspirations.

**Repeal of the Test Act: Catholic Emancipation.**

At home the Government had no settled policy. Lord John Russell forced upon it the Repeal of the Test and Corporation Acts in February, 1828, and thus removed a Nonconformist grievance. The Canningites had threatened revolt, and in May they resigned in a body over the question of the assignment of the seats of the disenfranchised borough of East Retford. Want of tact on Mr. Huskisson's part, rather than a deliberate intention on the Duke's to shed the more Liberal members of the Ministry was probably the cause of the rupture. Still, they went. Wellington's followers were soon compelled to surrender the chief principle on which the administration rested namely, that of resistance to Catholic Emancipation. This legacy from the Union had frequently come before the House of Commons. Resolutions in favour of the Catholics had passed only to be rejected by the Lords. The question became far more acute when its control in Ireland passed from the hands of an easy-going, aristocratic committee into the vigorous direction of O'Connell (p. 146). He formed the Catholic Association, and began to collect the Catholic rent in 1823. His meetings were perfectly orderly but they were inevitably calculated to provoke Protestant reprisals, and his lieutenants were none too discreet. Suppressed by law, the Association reconstituted itself as an educational and charitable combination. At the general election of 1826 O'Connell's candidate was returned for County Waterford, despite the Beresford interest. In the following year O'Connell, though ineligible, stood in person for Clare, against Mr. Vesey Fitzgerald. The forty-shilling freeholders deserted the landlords, and on the fifth day of the polling O'Connell's opponent withdrew.

The duke paused irresolutely between surrender and revolution. He compelled Anglesey, the Lord Lieutenant, to resign for blurting out his differences with the Government to O'Connell. But by the meeting of Parliament Peel's commonsense got the upper hand. As a preliminary Peel insisted




FUNERAL OF THE CONSTITUTION, 1829

*(From a contemporary satirical print.)*

upon the suppression of the Association, but it anticipated him by dissolving. The religious scruples of the king nearly wrecked the Government, but he was forced, in the end, to ask Ministers to remain. Peel, who, rejected by Oxford University, with difficulty found a seat at Westbury, was at last free to carry his Bills. They admitted Catholics to Parliament and office with the exception of the Lord Chancellorship and Viceroyalty of Ireland, while, as a safeguard, the Irish franchise was raised to £10. After a final struggle with the king, they became law. But agitation had taken deep root in Ireland, and O'Connell promptly began to harangue the peasantry on the repeal of the Union.

**Wellington's Foreign Policy.**

The duke was strongly in favour of non-intervention abroad. Hence he was rather unjustly accused of countenancing absolutism. He refused to interfere in Portugal, where Dom Miguel had, for the moment, succeeded in ousting his niece, and even prevented a loyalist expedition, fitted out in British ports, from landing on the Azores. His attitude was diplomatically correct, but it was liable to misconstruction. Even more damaging was his supposed dependence on the judgment of the Prince de Polignac, the reactionary Minister who was swept away by the French Revolution of July, 1830.

**Death of George IV.**

George IV. ended his useless life on June 26th. He was succeeded by his brother William IV., whose eccentricity was counterbalanced by his honesty. He sympathised at the outset with the cry for reform which, under stress of the upheaval abroad, was ringing through the land. Wellington was the only politician who could deal with George IV., and his death removed the chief reason for the continuance of the Ministry. The duke made overtures to the Canningites, but the death of Huskisson, who was killed at the opening of the Liverpool and Manchester Railway (p. 276), altered the situation, and they made common cause with the Whigs. On the opening of Parliament in November, 1830, the duke made an emphatic declaration in favour of the existing system of representation. After that the Government was hopelessly compromised; it was defeated on Sir Henry Parnell's motion for a select committee on the Civil List, and resigned.

**The Grey Ministry.**

Lord Grey, though nearly seventy years old, was the inevitable Prime Minister. Several Whigs entered the Cabinet:

1832]

Lord Lansdowne as President of the Council, Lord Althorp as Chancellor of the Exchequer, and, eventually, Lord Brougham as Chancellor. Lord Durham, the Lord Privy Seal, called himself a Radical. The Canningites secured the secretaryships —Lord Melbourne (Lamb), Palmerston, and Goderich going to the Home, Foreign, and Colonial Offices respectively. The

*Photo: Walker & Cockerell.*

WILLIAM IV.

(*National Portrait Gallery.*)

Ministry was strong in talent, but weak in administrative experience.

**The Reform Agitation.**

It was an anxious winter. There was rick-burning in the agricultural districts of the South. The artisans were moving in the North, and the violent language of the Birmingham Political Union was calculated to breed trouble. In Ireland one-fifth of the population was out of employment, and a tithe war was proceeding simultaneously with O'Connell's agitation for repeal. Melbourne, who as Home Secretary had control both of English and Irish affairs, behaved with firmness. The Birmingham League was left alone, but the rural rioters

were tried by a special commission. The Marquis of Anglesey, the Lord Lieutenant of Ireland, suppressed O'Connell's meetings, and finally arrested him, though the Act under which he was convicted expiring with the dissolution, he was never sentenced.

**The First and Second Reform Bills.**

On March 1st, Lord John Russell, the Paymaster of the Forces, brought in the Reform Bill. It proved too sweeping to please the House, and, after passing its second reading by a majority of one, suffered defeat in Committee on a proposal to reduce the number of members. Ministers decided not to resign, and induced the king to consent to a dissolution. They returned with a majority of over 130, and a new and still more thorough-going Bill was promptly introduced. Though the Opposition debated the measure at inordinate length, it passed through the Commons by large majorities. On October 8th the Lords rejected it on the first reading by 41. Rioting began immediately in the large towns, and at Bristol the weakness of Colonel Brereton gave the mob the upper hand for forty-eight hours. Supported, however, by a vote of confidence in the Lower House, Ministers decided to continue in office.

**The Final Bill.**

In March, 1832, Lord John Russell carried a third Bill through the Commons. Through the influence of the "Waverers," led by Lord Wharncliffe and Lord Harrowby, it passed its second reading by a majority of nine. In Committee, however, Lord Lyndhurst persuaded the Peers to vote for his motion postponing the disfranchising clauses. The Prime Minister had no other course than to press on the king the necessity of creating a batch of Peers, and, on his refusal, resigned. Wellington undertook the desperate task of forming a Cabinet of resistance to revolution. He failed to secure the support of Peel, and retreated from an untenable position. The renewed activity of the "Waverers," and a circular letter of the king's praying the Peers to cease their opposition, put an end to the crisis. On June 4th the Bill was free of the House of Lords.

**Its Provisions.**

In its final shape the Act disfranchised 56 boroughs with less than 2,000 inhabitants, returning 111 members, took a member from 30 boroughs with less than 4,000, and deprived one four-member constituency of two of its representatives.

1832]

Of these 143 seats, 65 were given to the counties; 22 large towns, including Manchester, Birmingham, and Leeds, received two members, and 21 smaller places one. Of the remaining 13 seats ten were transferred to Scotland, the other three being reserved to increase the Welsh representation. Copyholders, leaseholders, and tenants-at-will paying a £50 rent received the county franchise.[1] In the boroughs a uniform £10 household franchise was established, though the rights of resident freemen were respected. In the same session Reform Bills were passed for Scotland and Ireland. The first country received eight new members, while all owners of property, long leaseholders at £10 a year, and £50 tenants-at-will acquired the franchise. Ireland had five additional borough members, but the 40s. freeholders remained voteless.

W. LAIRD CLOWES. The Navy. Effects of the Peace.

In 1814, when the long Napoleonic war was, for the moment, terminated by the departure of Bonaparte for Elba, and by the return to France of Louis XVIII., Great Britain remained in hostilities with the United States of America, and was thus prevented from at once reducing her Navy to its ordinary peace establishment. She was enabled, however, to dispense almost immediately with the services of no fewer than 50,000 seamen. In the following year, although the fratricidal war with America was ended (Vol. V., p. 713), the reappearance of Napoleon in the field rendered any further reduction of armaments impossible, and during the greater part of that year 90,000 men had to be kept in readiness to serve their country at sea. But when 1815 was past and over, and when European peace seemed to be securely re-established by the banishment of the great disturber of it to a distant island, wholesale reductions were effected. The extent and nature of these will be clearly understood from the following comparative statement of the number of ships in commission, and of the number of seamen nominally in service, at the conclusion of each of the years 1813, 1814, 1815, 1816, and 1817 :—

[1 "By this provision, the power of the great landed proprietors over their tenantry is perpetuated: and thus arises a greater frustration of the purposes of the Act than from all other errors and faults together." Martineau, *Europe since the Peace*, I., 70. The clause was an amendment proposed by the Marquis of Chandos.]

| Ships in Commission. | 1813. | 1814. | 1815. | 1816. | 1817. |
|---|---|---|---|---|---|
| Of the Line-of-Battle ... | 99 | 47 | 30 | 14 | 13 |
| Cruisers ... | 495 | 392 | 213 | 100 | 89 |
| Special Service Vessels ... | 50 | 46 | 27 | 10 | 12 |
| Total Ships ... | 644 | 485 | 270 | 124 | 114 |
| Seamen and Marines Serving | 140,000 | 90,000 | 90,000 | 33,000 | 19,000 |

Thus, within the short space of four years, 530 ships of war were laid up or finally disposed of, and 121,000 seamen were thrown out of employment. The number of officers placed upon half-pay was, of course, proportionate. Leaving out of calculation the other ranks, we may fairly gauge the situation after a survey of the condition of the active list of the lieutenants. At the end of 1813 there were 3,285 of those officers; at the end of 1814, 3,211; at the end of 1815, 4,064; at the end of 1816, 4,012; and at the end of 1817, 3,949; so that there were positively more officers available for employment and consequent full pay in 1817, when but 114 vessels of all classes were required for the public service, than there had been in 1813, when 644 vessels were needed. Very little reflection will show that if every one of the lieutenants was employed in 1813, at least 3,350 must have been unemployed in 1817; and that if there were any unemployed lieutenants in 1813, the number unemployed in 1817 must have been even greater than 3,350. This state of affairs gave rise to an incalculable amount of misery among all classes throughout the country. The disbanded seamen had, with few exceptions, no resources whatsoever—possibly, in most cases, not even a trade to fall back upon. The case of the officers was almost as bad. The peace not merely deprived all of them of practically every prospect of prize-money, but also suddenly reduced the regular emoluments of upwards of 80 per cent. of them in the following proportions: Admirals, from £5 to £2 2s.; vice-admirals, from £4 to £1 12s. 6d.; rear-admirals, from £3 to £1 5s.; captains, from (in some instances) £2 3s. 10d. to 14s. 6d.; commanders, from 16s. 6d. to 8s. 6d., or, at best, to 10s.; and lieutenants to, in the vast majority of cases, as little as 5s. a day. In no case could a half-pay lieutenant expect to receive more than 7s., a sum which is equal to £127 15s. a year; and unless he

happened to be high up on the list, the prospect opened to him by the peace was one of having to support himself as a gentleman, and probably to support a wife and family as well, on an annual income of £91 5s. If further evidence be needed of the disastrous effects of the inevitable reduction of the naval establishment upon the pecuniary prospects of the individuals who, for upwards of twenty years, had kept Great Britain from the misfortunes of foreign domination, and had maintained her honour in every sea, it may be discovered in the figures of the

THE EMIGRATION OF OFFICERS.
(*From a satirical print of* 1828.)

Naval Estimates of the years immediately before and immediately succeeding the peace. The supplies voted for the sea-service were, in 1813, £20,096,709; in 1814, £19,312,070; in 1815, 19,032,700; in 1816, £10,114,345; in 1817, £7,645,422; and in 1818, £6,547,809.

These reductions were necessary enough; but the effect of them was almost equivalent to the temporary ruining of the naval profession. Seamen, idle from no fault of their own, thronged the streets of the large towns; and although many obtained engagements in the mercantile marine, there were still enough left ashore to form the nucleus of much disorder, and to materially assist in fanning popular discontent. As for the

officers, most of them either starved genteelly at home, or went abroad to seek to retrieve their shattered fortunes. Grants of land in various colonies drew away a certain number of them, naval as well as military, and helped in the peopling of Australia and Canada: but not every half-pay officer possessed the capital to enable him to take up a grant of land, or the inclination to settle down into the peaceful and monotonous pursuits of country life in an undeveloped district. This condition of things produced results the importance of which is universally acknowledged, but the history of which is now generally lost sight of.

British Officers in Foreign Service.

At the time of the peace, and indeed, for many years afterwards, the echoes of the French Revolution were still resounding loudly throughout a great part of both worlds (pp. 6, 9). The colonies of Spain and Portugal were beginning to be restless under the somewhat selfish dominion of the mother countries; Greece was painfully excogitating her independence; and soon many officers and men whose professional future in England had been so seriously compromised were found, serving, it is true, as mercenaries, yet ranged on the side of human progress and liberty, and furthering the advance of freedom and civilisation. Lord Cochrane, afterwards Earl of Dundonald, who had been unjustly deprived in 1814 of his commission in the Navy (although he was, happily, restored in 1832 to his rank and honours), was the most distinguished of these maritime adventurers and sailors of fortune. He carried out with him to Chile in 1818 a number of unemployed officers, most of whom won glory, and some riches as well, in the course of the struggle there, in Peru, and in Brazil, for the liberation of South America. Lord Cochrane had similar companions when subsequently he assisted the Greek revolutionary patriots. What he did for Chile and Brazil few other men of his day could have effected with such scant means as the feeble insurrectionary governments of those times were able to place at his disposal; and it is satisfactory to know that the memory of his work is kept alive in Chile to this day by the conferring of his name upon a battleship; and that in Brazil, at least until the fall of the Monarchy, he and his successors bore the title of Marquis of Maranhaõ. Among names which deserve to be associated with his in these exploits are those of Crosbie, Foster, Hind, Taylor, Jowett, Grenfell, Guise, and Spry; but scores of others might be men-

tioned; and, in fact, for many years after 1815, there was no war in the New World or in the Old in which, as adventurers, the half-pay veterans of our own long struggle with France did not take part. The practical disbanding of those tried and gallant

LORD COCHRANE, EARL OF DUNDONALD.
(*After the painting by P. E. Strochling.*)

fellows at the peace had a far wider influence than is commonly suspected both upon the development of what are now the large self-governing colonies, and upon the constitutional growth of much of the rest of the world.

Promotion Blocked.

Another result of the peace was the previously unparalleled blocking of promotion in the various commissioned grades of the naval service. So long as war lasted there was possible promotion, at least as far as post-rank, for all; and, from 1793

to 1815, deserving officers were seldom neglected for long by those with whom lay the selection. But the very readiness of the Admiralty to reward good service during war-time led in peace-time to considerable personal hardships, besides being in some instances distinctly antagonistic to the public welfare. The promotions consequent upon the happy conclusion of hostilities brought the captains' list up to 883, the highest point it has ever attained since a British Navy has existed. At the time when that maximum was reached—it was in 1818—the senior captain on the list had held that rank for twenty-two years, a period more than long enough, consistently with the best interests of the service, to qualify for flag-rank and command. Yet twenty-two years was a very short period in comparison with the time for which officers who at the peace were captains of medium or junior standing had to wait ere they attained flag-rank. The evil reached its height in 1841. In the earlier part of that year all the captains at the head of the list were men who had held post-rank ever since the year after Trafalgar. The senior one of them, judged by the date of his commission as captain was sixty-eight years of age; several were over seventy; and one, at least, was as much as seventy-eight. Yet it was from among these old gentlemen that the list of admirals had to be recruited; for then, as now, promotion to flag-rank went by simple seniority; and, to make matters worse, there was at that time no regular scheme of retirement for officers above the rank of commander. The consequence was that almost all the admirals, besides a large number of captains, were too old to be in a condition to render effective service in their profession: and the political caricaturist was justified, a little later, in representing the typical commander-in-chief of the period as a gouty veteran, obliged to promenade his quarter-deck in a bath-chair. Both Sir J. C. White and Vice-Admiral Edward Harvey were seventy-four when they took up the command at the Nore: Admiral Bowles was seventy-nine when he became port-admiral at Portsmouth: Sir David Milne was of the same age when he assumed the like office at Devonport; and, even on foreign stations, Sir Robert Stopford flew his flag at seventy-three; Sir Peter Halkett, at seventy-two; Rear-Admiral C. J. Austen, at seventy-three; and Lord Dundonald, at seventy-five. And, in spite of

1832]

such facilities as existed in 1841 for the retirement of officers of rank less than that of post-captain, the active lists were still choked throughout with old officers, survivors of the French wars. Of this category, there were about 200 commanders and 1,450 lieutenants who had received no promotion whatsoever for a period of twenty-six years or more. One officer had been a commander for forty-seven years; another had been a lieutenant for sixty years; yet another had been a master for sixty-one years; and there was a purser with sixty-four years' service in that rank to his credit. All these officers, however, were set down in the Navy List as being fit for duty.

Naval Retirement.

It was the existence of this extraordinary state of affairs that induced the Admiralty to adopt a more reasonable and comprehensive scheme of naval retirement than had previously been in force. As early as 1816, not to go farther back, 100 of the senior lieutenants who, owing to age and infirmities, were assumed to be incapable of further service, had been permitted to retire with the rank of commander and a pension of 8s. 6d. a day; and in 1830 another Order-in-Council had authorised the retirement of lieutenants of sufficient seniority to be in receipt of half-pay at 7s. a day. But these measures had thinned the lower ranks only to a partial extent, and had left the equally crowded upper ranks untouched. A further step was taken in 1840, when fifty of the senior commanders were allowed to retire with the rank of captain and with half-pay of 10s. 6d. a day. Yet still the tension remained unrelieved until the elaboration of a more general scheme, which was published in the *London Gazette* of September 1st, 1846, and became part of the regulations under an Order-in-Council of April, 1847. This measure permitted the retirement, as rear-admirals, of captains whose seniority placed them on the 14s. 6d. half-pay list; the retirement, with increased pay, of certain other captains of not less than twenty years' seniority; and the reduction to manageable proportions of the active list. New Orders-in-Council followed in 1851, 1856, 1860, 1864, and 1866; and in 1870 a complete fresh scheme for all ranks was at length adopted. This, although it has since been considerably modified, remains the basis of the present system of naval retirement. It may be said that the schemes, just and salutary upon the whole, which thus received, as it were, their

codification in 1870, were the direct outcome of the long and trying wars of the beginning of the century. Nothing, indeed, is more certain than that for successful commanders at sea in war-time the country must look chiefly to the officers who are still in, or below, the prime of life; and that the best interests of the service require that it should be possible for capable officers to reach flag-rank by the age of forty, as Nelson did.

**The Navy in the Crimean War.**

Some of the evil consequences of the neglect and procrastination of the Admiralty in dealing with the situation bequeathed to us by the war which ended in 1815 appear to have hampered the country when, nearly forty years later, war broke out with Russia. During that war the Navy, all things considered, effected remarkably little; and the expectations of the country were notoriously disappointed. The excessive age of many of the flag-officers and captains who were entrusted with commands may be accepted in partial explanation of the result. Both Napier and Dundas were nearly seventy; and Lyons and Price, though only rear-admirals, were sixty-six; while several captains, both in the Black Sea and in the Baltic, were upwards of sixty years of age. From officers of such advanced life, the energy, activity, and mental suppleness that distinguish capable younger men cannot be expected. The sea, moreover, is an exceptionally wearing calling, and was even more so in the first half of the century than it is now. This has since been to some extent recognised in our own and other Navies. A British admiral is now obliged to retire at sixty-five, and a rear-admiral at sixty. In Germany, even these ages are considered too great to admit of full efficiency. There, no officer can remain on the active list after he is fifty-six; and rear-admirals are perforce retired at fifty-three.

**Rating of Ships.**

It is important for the student of naval history to understand the principles according to which British ships of war were "rated" at various times, and what, in the days of our wooden walls, was the real meaning of such expressions as "a 36-gun frigate," "a seventy-four," and so on. As a great and sensible, if not entirely satisfactory, change in the system of rating was introduced in 1817, immediately after the peace, the present seems to be a convenient opportunity for dealing with the subject.

In the seventeenth century, and in the first three-quarters of

the eighteenth, a vessel was rated and described according to what may be regarded as the natural plan; that is, if she actually carried 60 guns, she was known as a 60-gun ship. But in 1779, when the carronade was made a regular service weapon, nearly all vessels were given a certain number of these pieces of ordnance, in addition to their complement of guns. For instance, the 100-gun ships were given 10 carronades; 90- and 98-gun ships were given 10 also; 74-gun ships were given 8; 50-gun ships were given 10, etc. To put the matter more concisely for purposes of reference, the true gun strength of the chief classes of ships, as distinct from the conventional gun strength, became as follows:—

| Rate. | Nominal Guns. | Actual Guns. |
|---|---|---|
| First | 100 | 110 |
| Second | 98 | 108 |
| ,, | 90 | 100 |
| Third | 74 | 82 |
| ,, | 64 | 72 |
| Fourth | 50 | 60 |
| Fifth | 44 | 54 |
| ,, | 38 | 48 |
| ,, | 36 | 44 |
| ,, | 32 | 40 |
| Sixth | 28 | 34 |
| ,, | 24 | 34 |
| ,, | 20 | 28 |
| Sloops | 18 | 26 |
| ,, | 16 | 24 |
| ,, | 14 | 22 |

Yet, in spite of these considerable alterations, ships continued to be officially classed as they had been classed before the change. Other changes in the armament of ships were effected subsequently, not only in consequence of Admiralty orders, but also to suit the theories or temporary wishes of individual captains: so that in course of time the official classification came to be almost meaningless. Any addition of long guns to a ship raised her class in the Admiralty estimate; but no addition of carronades modified her status on the books of the Navy. Thus, when in 1780 the *Canada* received two extra 18-pounder long guns, she rose from the position of a 74 to that of a 76; but when in the following year the *Goliath*, 74, was given, as part of

Anomalies of Classification

her extra armament, two 68-pounder carronades, she still remained a 74, although the additions made her probably a more powerful ship, especially at close quarters, than the *Canada*. When, therefore, in the history of the French wars, or of the war of 1812, we read that a British ship was officially classed as carrying a certain number of guns, we get little or no guide to her actual offensive strength. The inconvenience of this state of affairs was recognised when the recurrence of peace

MODEL OF H.M.S. *ARIADNE*.
(*Victoria and Albert Museum.*)

enabled the Admiralty to consider the point; and efforts were at once made to remedy it. But the Order-in-Council of February, 1817, was after all only a half-measure: for it merely directed that in future all his Majesty's ships should be rated at the number of guns and carronades which they actually carried on their decks, quarter-decks, and forecastles; and it left out of account the carronades which, in the ships of the three higher rates in the Navy, were carried on the poop. Thus, the *Superb*, 74, though officially promoted to be a 78, should in reality have been promoted to be an 84. Indeed, all the first, second, and third rates, even after the new Order, and the accompanying

MEN-OF-WAR IN PORT, BY W. ANDERSON.

*(Victoria and Albert Museum. By permission of T. Dyer Edwardes, Esq.)*

declaration that "the force of each ship is stated according to the number of guns and carronades actually carried," continued to mount six more weapons than they were credited with. The *Victory*, 104, was a 110: the *Queen Charlotte*, 108, was a 114; the *Prince*, 98, was a 104; and, in fact, it would appear that the rule had practically no exceptions. These and other anomalies were not entirely got rid of until the promulgation of a new scale of armament in 1847; and even then they were got rid of only for a comparatively short time. Certain guns, especially if of comparatively small size, soon began to be again neglected in the official estimation of a ship's armament; and after armoured vessels became a well-established feature in the Navy small guns were gradually left wholly out of account, until in 1885—the year in which this survey closes—the official Navy List was even more misleading than the official Navy List of 1814 had been. In 1885, for example, one of the most formidable completed ships in the service was the *Collingwood*, which the Navy List described as of 10 guns; and one of the most insignificant was the wooden corvette *Druid*, which was described as of 14. As a matter of fact, the *Collingwood* really carried 35 guns, large and small, and the *Druid* only 22; but that statement by no means reflects the true difference between the force of the ships. The *Druid's* 14 guns, the sole ones which were deemed worthy of official notice, were all 64-pounder muzzle-loaders, of no armour-piercing value whatsoever: the *Collingwood's* 10 guns comprised four 12-inch breechloaders, ranking among the most powerful guns then in the service, and six 6-inch breechloaders, all more than capable of piercing 10 inches of iron armour at a distance of 1,000 yards, besides 12 guns which were of much greater utility than anything mounted by the *Druid*. Moreover, a single gun in the *Collingwood* weighed very nearly as much as the entire armament of the other vessel.

W. H. HUTTON. The Church.

THE powerful influence which had done so much to mould English religious feeling, and to direct its course along particular channels of opinion during the later years of the eighteenth century, had lost, during the earlier part of the present century, some of its more prominent characteristics. Evangelicalism had abandoned something of its austere spirit, and,

while it had succeeded in arousing among the educated classes a much more serious apprehension of social and religious problems than had been common when Bishop Butler made his famous lament, it had itself been insensibly affected by the society which it had influenced, and tended to become, if not "worldly," at least reasonable, polite, and not unfashionable.

If we turn first to the character of the religious laity of the period, we shall see how strong had been the influence in which they were nurtured, and how in later life it had encouraged the pursuit of an ideal of definite philanthropy. Nor need it be said that this influence was by no means confined solely to those who would have called themselves "Evangelicals," or to members of the Church of England. One of the greatest practical workers for true religion and sound learning was imbued with the older—the Caroline, or Reformation—principles of the Church; while among the pioneers of philanthropic effort were the leading members of the Society of Friends. Foremost among philanthropists was the great Evangelical, William Wilberforce. He it was, more than any other, who by his life-long labours enforced on Parliament, through the education of the popular conscience, the abolition of the traffic in human beings. Evangelicalism, through one of its greatest leaders, George Whitefield, had supported slavery: now from an Evangelical the slave-trade received its death-blow. Wilberforce, through his friendship with the leading statesmen of the day, enjoyed a position of exceptional advantage for the work to which he devoted himself. He was a link between the so-called "Clapham Sect" (the body of wealthy business men and others who circled round the Rev. John Venn, rector of Clapham) and the London society of the day. By his side were peers such as Lord Teignmouth and Lord Dartmouth, and the rich families of the Gurneys and the Buxtons. For literary influence the religious and social movements of the time were indebted to the vigorous and popular writings of Hannah More. This kindly and bright old lady, herself playwright and novelist as well as writer of religious tracts, who is a fit link between the ecclesiastical opinions of such typical English writers as Dr. Johnson and Mr. E. A. Freeman, died in 1832. William Wilberforce (whom J. J. Gurney described as "always in sunshine, his mind strung to a perpetual tune of love and praise") died on

**Evangelicalism and other Influences for Philanthropy.**

July 29th, 1833, a month before the Bill for the Abolition of Slavery became law (p. 152). There could not be two better examples of the influence of religion and philanthropy on the life of the English nation. The names of both were household words beyond the boundaries of Great Britain. Wilberforce was buried in the Abbey between Canning and Pitt. Hannah More's books were read, it may almost be said, in every English home. The anti-slavery movement represented the best current of English feeling, and was by no means tied to any particular religious body. Fowell Buxton presented a petition for abolition from 187,000 women of Great Britain. Already practical men like J. J. Gurney, and literary artists like Thomas Love Peacock in "Melincourt," had urged the disuse of sugar till the slaves who made it should be freed.

The philanthropy which so warmly espoused the anti-slavery cause was no less powerful in social work within the land. In the winter of 1816-17 Mrs. Fry began her systematic visits to the prisoners in Newgate, in which she was assisted by many ladies, Churchwomen as well as Friends, and which had so remarkable an effect on the nature of prison discipline throughout the country.

**Two Lay Churchmen.**

Among the laymen who devoted themselves to the theoretical and practical interests of the Church, two should especially be mentioned. Alexander Knox, well known in his earlier life as a political writer, in later years was prominent in defence of the Church. His especial work it was to defend the teaching of the Church as embodied in the Prayer Book—a task which had a distinct value when great laxity as to standards of doctrine and worship prevailed. He died on January 17th, 1831. More active in good works was Joshua Watson, who did great things for the literature and the missions of the Church in connection with the Societies for Promoting Christian Knowledge, and for the Propagation of the Gospel in Foreign Parts. Through his energetic devotion the interests of religion were continually supported in Parliament. He became the constant adviser of the Archbishop of Canterbury (Manners-Sutton), and it was not a little through his influence that many new Church societies were founded, and that the colonial episcopate was organised and endowed.

Of the clergy of this period two very different pictures might be drawn. They might be described as secular, though kindly and generous, as scholars and gentlemen rather than missionaries and priests. The novels of Peacock, of Jane Austen and George Eliot, sketch clergymen of varying types which might fall within this description. Certainly we should not greatly wrong them if we wrote across the clergy list, "*surtout point de zèle.*" The "high and dry" school had principles which connected it with a great past. It "inherited the traditions of a learned and sober Anglicanism, claiming as the authorities for its theology the great line of English divines from Hooker to Waterland, finding its patterns of devotion in Bishop Wilson, Bishop Horne, and the 'Whole Duty of Man,' but not forgetful of Andrewes, Jeremy Taylor, and Ken—preaching, without passion or excitement, scholar-like, careful, wise, often vigorously reasoned discourses on the capital points of faith and morals, and exhibiting in its adherents, who were many and important, all the varieties of a great and far-descended school, which claimed for itself rightful possession of the ground which it held. There was nothing effeminate about it, there was nothing fanatical; there was nothing extreme or foolish about it: it was a manly school, distrustful of high-wrought feelings and professions, cultivating self-command and shy of display, and setting up as its mark, in contrast to what seemed to it sentimental weakness, a reasonable and serious idea of duty."[1] To that school belonged great scholars like Dr. Routh, great prelates like Bishop Van

The Clergy.

*Photo: Walker & Cockerell.*

MRS. ELIZABETH FRY, AFTER C. R. LESLIE, R.A.

(*National Portrait Gallery*).

High Church.

[1] Dean Church, "The Oxford Movement," pp. 8–9.

Mildert of Durham, and—most striking example of all, and occupying its position when it had been largely abandoned on both sides—the great parish priest, Walter Farquhar Hook, who carried on its tradition to a much later generation.

Evangelicals.

The Evangelical party, on the other hand, had a body of theology which was less wide, but certainly not less sincere. They were led by men such as Charles Simeon, the influence of whose strong character and long and blameless life gave to his opinions a prolonged and almost unquestioned supremacy in the University of Cambridge. This school was stronger in sentiment and personal piety than in theology; and from it, a few years later, came 'almost all the first important converts to Rome."[1] It was powerful in the support of rich lay folk, and started what Sydney Smith called "a regular fund to purchase livings for those groaning and garrulous gentlemen whom they denominate (by a standing sarcasm against the regular Church) gospel preachers and vital clergymen"; yet "the deepest and most fervid religion during the first three decades of this century was that of the Evangelicals."[2]

Two facts are especially significant in the religious history of this period. The first is the strong movement, somewhat hastily identified with the Liberalism of the day, against religious establishments in general and the Church in particular. The second is the formation, below the surface, of a new and vigorous party of reform on the lines of traditional Church teaching.

Fears for the Establishment.

It would be difficult to exaggerate the alarm with which timid Churchmen regarded the future at the period of the Reform Bill of 1832. "The Whigs had come into power; Lord Grey had told the bishops to set their houses in order, and some of the prelates had been insulted and threatened in the streets of London."[3] Several Irish bishoprics had been suppressed. Dr. Pusey, then known only as a young and very learned Oxford professor, expressed to Mr. Gladstone, who had just entered Parliament, his sense of the dangerous appearance of public affairs—"The appearances of things are very formidable, if a Christian might fear." Men of less caution and restraint felt still greater alarm. Dr. Arnold, the great school-

[1] Archdeacon Perry, "Church of England," 3rd period, p. 195.

[2] Liddon, "Life of Pusey," vol. i., p. 255. [3] Newman, "Apologia," p. 30.

1832]

master, who had such enormous effect on the religion of the next generation, wrote, in 1832, "The Church as it now stands no human power can save." In his pamphlet, "The Principles of Church Reform," Dr. Arnold proposed to make the Church once more identical with the State, by admitting all

DR. MARTIN JOSEPH ROUTH.
(*After H. W. Pickersgill, R.A.*)

denominations to its fold without requiring them to surrender any of their distinctive doctrines. So strangely unpractical were some of the schemes then suggested. The danger, like other terrors, passed away, and left religion and the Church stronger rather than weaker for the crisis. The strength came in no small measure from the party which was springing up, chiefly in Oxford.

The Oxford Movement.

Of Oxford, in 1830, Mark Pattison writes,[1] "The true revolutionary spirit was already there, though it had not yet taken the precise direction which it afterwards did." He is speaking briefly of Oriel, and the tutors, J. H. Newman, R. I. Wilberforce, and R. H. Froude. "They were, however," he adds, "young men; Newman, the oldest of the three, was thirty, and little known. Neither my father nor his adviser could have any knowledge of the stimulating power which was latent in the Oriel tutors of 1830." The influence had already spread outside Oxford. John Keble had published, in 1827, "The Christian Year." William Palmer, a graduate of Dublin who had come to study in Oxford, published, in 1832, his "Origines Liturgicæ." In 1829 Isaac Williams went to the curacy of Windrush, a little parish on the borders of Gloucestershire and Oxfordshire. In 1832–33 Newman was travelling in Italy, and unconsciously preparing for the great work he was to do. Pusey was quietly studying and teaching at Christ Church. Poetry, the study of ancient sources, humble ministerial work, earnest aspiration and profound learning, all these were to be represented in the movement which was to form the parallel in the nineteenth century to the Wesleyan movement of the eighteenth.

*Photo: Walker & Cockerell.*
DR. THOMAS ARNOLD, BY WILLIAM BEHNES.
(*National Portrait Gallery.*)

H. D. TRAILL. Literature

THE decade which followed upon the Battle of Waterloo was crowded with splendid achievements in English poetry. Some, it is true, of the great singers who have made the age famous had fallen silent, or had sung their best. Coleridge's "Christabel," that germ of the new romance poetry, which had already done its fertilising work in manuscript, had still to

[1] "Memoirs," p. 28.

make its published appearance in the second year of the period, and to be succeeded on the part of its author by a long interval of silence, broken only in the poet's later years by utterances of for the most part far inferior power. The greatest efforts of Wordsworth's long poetic life had been made several years before. Scott closed the series of his romantic poems with "The Lord of the Isles" in 1815, having published the first of the immortal Waverley Novels in the previous year. But between 1815 and 1823 all the best works of Shelley and Byron and the entire and too slender body of Keats's poetry were given to the world. A decade which covers the publication of "The Revolt of Islam" (1817), the "Prometheus Unbound" (1819), the "Hellas" and the "Adonais" (1821); of the Third (1816) and Fourth (1818) Cantos of "Childe Harold," the whole of the Byronic drama (1817–22), and "Don Juan" (1819–23); of the "Endymion" (1818), of the "Hyperion" (1819), and of those two incomparable odes, "To a Nightingale" and "On a Grecian Urn," is not to be matched in any period of our own or perhaps of the world's history.

Byron, 1788-1824.

But the three poets whose masterpieces appeared in such quick succession during these seven or eight years had little but their productive fertility in common, and—though two of them are among the glories of English literature, while the third shares with Scott the honour of having given that literature its widest European vogue and influence—differed as strikingly in gift as in circumstances and career. Byron, whose fame came to him in a day and deserted him within a few years of his death for more than a generation, ranks far below Keats and still further below Shelley in the order of purely poetic merit. There are even some who have denied him the title of poet altogether; and, indeed, at the height of the reaction which followed upon the Byronic enthusiasm of the early century, it is not improbable that a majority of otherwise competent English critics would have concurred in that denial. Nor from one point of view is this surprising. The defects both of the matter and manner of Byron's poetry are not only patent but obtrusive. His workmanship is often rough and careless to the point of slovenliness; his imagination, though powerful, and his passion, though intense, are both of strictly limited range; he has nothing of Shelley's tremulous sensibility to beauty

either in art or nature, nor any trace of Wordsworth's profound insight into the mystery of the external world. His command over the reader, where and when it is exercised, is a pure triumph of force and fire. his influence is akin to that of the

LORD BYRON, BY THOMAS PHILLIPS, R.A.
*(In the possession of Lady Clermside.)*

orator rather than of the poet. It sweeps tempestuously over the emotions like one of the "white squalls" of his beloved Mediterranean over its waters, agitating them vehemently enough on their surface, but never stirring them to their depths. And it is perhaps to his mastery of these simple emotional effects that he owes his attraction for the foreign reader, who is naturally less sensible to those subtler poetic beauties which are

in a great measure hidden from him under the unappreciated shades of meaning and the unfelt associations of a comparatively unfamiliar language.

Meanwhile, however, the progress of the years "which

*Photo: Walker & Cockerell.*

PERCY BYSSHE SHELLEY BY MISS AMELIA CURRAN.
(*National Portrait Gallery.*)

bring the philosophic mind"—or should bring it—to the critic as much as to the individual poet has to some extent rescued Byron from the neglect to which for well-nigh half a century he was consigned. In an age which has been rendered fastidious by familiarity with a hitherto unapproached excellence of artistic form in poetry, it is unlikely that he will ever regain his former popularity; but a generation of critics more catholic

in their tastes and less prejudiced in their judgment than their immediate predecessors have learnt the lesson of respect for the magnificent strength and sweep of versified rhetoric in "Childe Harold," for the fine dramatic quality of "Marino Faliero" and its companion tragedies, and, above all, for the brilliant assemblage of intellectual, if not always of strictly poetic, gifts, which is displayed on every page of "Don Juan."

Shelley, 1792-1822.

The fame of Shelley has not only been of slower growth, but has not even now attained, and probably never will attain, to the proportions which were reached by that of Byron during the second decade of the century. In the spiritual quality of his imagination there is none to compare with him in any age of our literature, and in mysterious magic of language we have to go to the greatest of the Elizabethans to find his peer. There are short passages and even single lines in Shelley which haunt the memory like Prospero's farewell to his wizardry, like Lorenzo's "moonlight speech" to Jessica, like Perdita's rhapsody on the flowers let fall by Proserpine. But his poetry, in its higher flights, is not only too ethereal for "human nature's daily food," it is unfitted for the spiritual sustenance of even the rarer types of human nature save in moments of exceptional exaltation. As for the ordinary mortal, he can no more "breathe in that fine air" than could Guinevere in the cold and saintly atmosphere with which Arthur surrounded himself. The rarefied, the almost de-humanized, character of Shelley's thought is nowhere more strikingly shown than in the alienating effect which it exercised even on so high and so idealistic an intelligence as that of Matthew Arnold, and which disabled that otherwise acute critic from doing him justice. Yet his famous comparison of Shelley to "a beautiful but ineffectual angel beating in the void his luminous wings in vain" needs only a slight modification in a couple of points to make the image as perfectly accurate as it is poetical and picturesque. "Ineffectual" and "in vain" are exaggerated expressions. They are only true of Shelley at those moments when he attempts more than human speech can compass, and it is going too far to say that this is constant or even frequent with him. But to that habitually hovering elevation of his poetry above the ordinary thoughts and passions and hopes of humanity, Arnold's angelic metaphor is admirably appropriate. If Shelley

does not beat his wings "in vain," he beats them "in the void." He is the poet of philosophers, dreamers, revolutionaries, of all who are furthest removed from the life of their fellow-men; and that is why, of all the world's great poets, it is he who has exercised the least influence on the poetry of the world.

Imperfect, on the other hand, as was the achievement of Keats, many and serious as were his disadvantages of worldly

Keats, 1795-1821.

*Photo: Walker & Cockerell.*
JOHN KEATS, BY WILLIAM HILTON, R.A.
*(National Portrait Gallery.)*

position and surroundings, and premature as was the death by which the full development of his genius was cut short, it is to him whom we must look as the transmitter of the poetic tradition of our Augustan age to the present era. A fuller pulse of humanity beats in him than in Shelley, a more frankly sensuous delight in material beauty animates his verse: for Shelley's prevailing mysticism, in which only the finest and subtlest spirits can find any satisfying charm, he substitutes a glow of romantic ardour which must communicate itself in some measure at any rate to all but the dullest and most

hopelessly prosaic of human minds. We descend, in fact, from that supernal, but barely respirable, ether bathed in unearthly radiance, wherein Shelley habitually moves, to the revivifying atmosphere and exhilarating sunlight of the common day.

Minor Poets.

In our present era of too copious poetical and quasi-poetical production it is interesting to note by how few names, save those of actual immortals, this greatest since Elizabeth's days of all periods of English poetry was illustrated. Wordsworth, Coleridge, Scott, Byron, Shelley, Keats—it was by the magnitude, not the multitude, of such names as these that the age was rendered famous. As a list of immortals it would be a long one for even half a century, but as an enumeration of nearly all the writers who were worthy to be styled poets at all, it would be short even for twenty years. Yet outside this list it is difficult to find anyone fairly entitled to the honours of a poet, even of the second rank. The doubtful exceptions of Moore and Campbell have been noticed in a previous volume, and the no less questionable claims of Landor might be admitted to a place beside theirs; but to Rogers it is quite impossible to concede more than the merit of an agreeable versifier, and though "sonneteering Bowles" had enough of "the root of the matter" in him to inspire Coleridge, he cannot be said to deserve more than the credit of good intentions unequally matched with his powers of execution.

Essayists.

The prose, however, of the period covered by this chapter is in a different case: for if among its masters there are perhaps but three—De Quincey, Lamb, and Landor—who can be regarded as of the first rank in point of style, the catalogue of distinguished essayists and critics is for the next twenty to twenty-five years an imposingly long one. Between 1815 and 1840 not only had two of the three writers above mentioned done all their best work, and the third completed his enduring contribution to English literature and passed away, but men so eminent in their various departments as Hazlitt, Wilson, Lockhart, Sydney Smith, Hallam, Cobbett, Leigh Hunt, were in full literary activity, and even within the first ten years of the period an essayist destined to become more famous than any of them had made his *début* in the periodical press in the person of Macaulay.

If we put the name of De Quincey (1785-1859) first, it is

1332]

certainly not because of any transcendent perfection in the style of one who is in truth an extremely unequal writer. Were the place to be awarded on that principle to any essayist of the period, it would assuredly fall to Charles Lamb (1775-1834), who, indeed, is perhaps the most remarkable example in all literature of a writer whose mere manner of saying the thing—apart altogether from the wisdom, wit, humour, pathos, tenderness, urbanity of the thing said, though in all of these qualities he is conspicuous—is an unfailing source of delight. Something of the same sort, though with an application to a far more limited

De Quincey

Lamb.

Landor.

CHARLES AND MARY LAMB, BY FRANCIS STEPHEN CAREY.
(*National Portrait Gallery.*)

list of qualities, may be said of Walter Savage Landor (1775–1864), whose noble monumental style, far more truly and successfully Greek than his attempted Hellenisings in verse, has reconciled many a reader to as perversely ill-assorted a set of political and literary opinions as was ever begotten of the union of Tory prejudices and Jacobin theories in the same person, and to as arrogantly defiant a dogmatism as overweening pride of

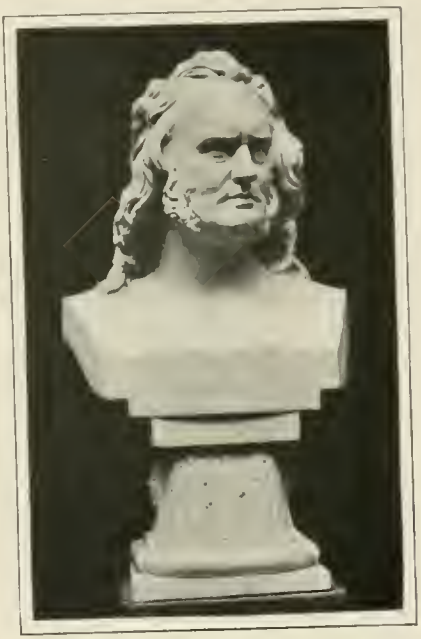
Photo Walker & Cockerell.

THOMAS DE QUINCEY, BY SIR J. WATSON GORDON, R.A.
(*National Portrait Gallery.*)

intellect ever brought to their support. But the interest of De Quincey is that of an experimenter and pioneer in English prose. He may, in fact, be described as the inventor of that variety of prose—a questionable variety in the hands of many of his successors—which has been named the "poetic": a form in which, to attain the ends of vivid description or of impassioned narrative, the restraints which the elder prose-masters deliberately imposed upon themselves in respect both of construction and vocabulary were as deliberately thrown off. In other words, the attempt was for the first time made to arouse

1832]

emotions as vehement in the mind of a reader through the medium of prose as are or may be excited by the instrumentality of verse. In some of De Quincey's most famous passages this exaltation of the *emotional* power of prose is overwhelmingly felt. "The Vision of Sudden Death," for instance, excites like a thrilling scene of drama; and the "Dream Fugue" that follows it impresses like a majestic poem. The highly coloured diction and the impassioned rhythms by which these dramatic and poetic effects are produced are not employed with invariable taste and discretion, and when they fail in their more ambitious attempts the result is distressing. But, unequal as he is, De Quincey fails very rarely in this respect, and his successes did undoubtedly reveal new capacities in English prose, which contemporaries like John Wilson (1785–1854), and successors like John Ruskin, were destined still further to develop.



JOHN WILSON (CHRISTOPHER NORTH), BY JAMES FILLANS.

(*Scottish National Portrait Gallery*)

The mention of John Wilson recalls a circumstance which, in the pages of a history concerned primarily rather with movements than with men, is especially worthy of note—the growing importance, that is to say, of the connection between literature and the periodical press of the day. The famous prose-writer whom we have just dealt with gave all his best known pieces to the world through the medium of "the magazines." "The Confessions of an Opium-eater," for instance, appeared in the *London*, which miscellany had also the undying honour of ushering the

**Literature and the Magazines.**

"Essays of Elia" into the world; and in later years De Quincey wrote much for *Hogg's Instructor* and *Tait's Magazine*. Another case is that of William Hazlitt (1778–1830), a fine, though unequal essayist, and the most accomplished dramatic critic that England has produced. The entire period, in short, is remarkable for the rapid and successful development of that organisation of criticism the beginnings of which were noticed in the closing chapter of the last volume (V., p. 802). To the *Edinburgh Review*, in which Jeffrey (V., p. 804) had among his principal colleagues the brilliantly witty Sydney Smith (1771–1845) and the versatile Brougham (1778–1868), whose omniscience did not exclude real knowledge of some of the subjects which he handled: and to the *Quarterly*, which under Gifford's editorship, and with such men as Southey and Scott among its contributors, had rapidly risen into rivalry with the older periodical, was, in 1817, added *Blackwood's Magazine*, an organ of more pronounced Conservatism, both in politics and literature, than the *Quarterly*. This periodical was for many years distinguished by the writings of John Wilson, under the pseudonym of "Christopher North," a poet of little mark, but an essayist and *causeur* of commanding and singularly varied powers, whose "Noctes Ambrosianæ," though always somewhat of a stumbling-block to the Southron reader, still preserves for those who have attained the proper "point of view" the original charm of its gaiety, wit, and dramatic humour, its innumerable episodes of brilliant, if sometimes perverse, criticism, and its occasional passages of admirably eloquent prose. It is perhaps, indeed, as a prose-writer of the new "poetic" school founded by De Quincey that Wilson would first claim consideration, were it not that his influence upon English literature in this capacity was far more limited than that of the author of "The Confessions of an Opium-eater." Another writer of distinction, who was a contributor to *Blackwood* in its early days, was John Gibson Lockhart (1794–1854), afterwards editor of the *Quarterly*, a critic of sound judgment and scholarly equipment, though given to a severity of expression that sometimes bordered on the brutal, but whose enduring fame reposes on his admirable Life—by general consent one of the two or three greatest biographies in the language—of his illustrious father-in-law, Sir Walter Scott.

Christopher North.

Lockhart.

Of a yet earlier date than the birth of the Tory *Blackwood*, or, indeed, than its quarterly predecessor of the same politics, was the Radical *Examiner*, a weekly journal started and for fourteen years conducted by the brothers Hunt. The former of these, Leigh Hunt (1784–1859), has secured himself a place in the history of the period, if not by the bulk of his prose-writings—which, indeed, are often undistinguished enough—yet by occasional pieces of genuine merit both for thought and style, and by a finely

Leigh Hunt.

*Photo: Walker & Cockerell.*

LEIGH HUNT, BY BENJAMIN ROBERT HAYDON.
(*National Portrait Gallery.*)

sympathetic appreciation of all that is best in literature. And the list of periodicals may, perhaps, fitly close with one which was associated throughout its history with the name of a writer of far greater power and of widely different temperament—to wit, the *Weekly Register*, a journal in which William Cobbett (1762–1835: p. 120) for years displayed, amid many extravagances of prejudice and erudities of utterance, a command of racy, homely, and vigorous English which made him the most popular, if not the most powerful, political writer of his time. The immensely important part played by periodicals in the advancement of letters during these years may, perhaps, be most conveniently measured by viewing it from the point of view

Cobbett.

adopted in his history of "Nineteenth Century Literature" by Professor Saintsbury, who, after enumerating Cobbett, Jeffrey, Sydney Smith, John Wilson, Charles Lamb, Leigh Hunt, Hazlitt, De Quincey, Lockhart, and some others, remarks, with perfect truth, that all of them were, "if not exactly journalists, at any rate such frequent contributors to periodical literature of one kind or another that in some cases nothing, in most comparatively little, would be left of their work if contributions to newspapers, reviews, and magazines were to be excluded from it."

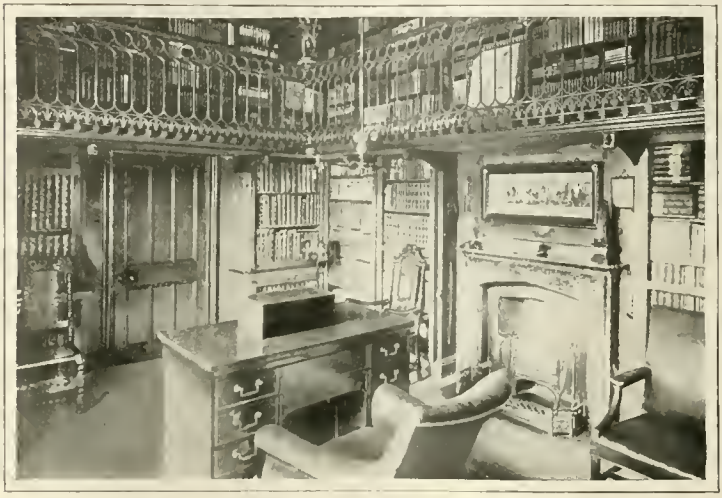


*Photo: Wilson, Aberdeen.*

SIR WALTER SCOTT'S STUDY, ABBOTSFORD.

Scott.

Rich, however, as was the contribution of critics and essayists to the prose literature of this period, it was surpassed in splendour and far outdone in historic importance and progenitive potency by the achievements of its one great novelist. The seventeen years over which this chapter extends have been rendered ever memorable, not only by the production in the Waverley Novels of by far the most splendid series of imaginative prose works to which any single mind has ever given birth, but also, and therewith, by the addition of what may fairly be called an entirely new form to those three or four very ancient moulds into which man has poured the fused metal of the imagination since literature began. For Scott was

the creator of the historic romance—a form which differed from the epic in prose or poetry in that it did not confine itself to the deeds of historical or historico-mythical personages; from the *contes* and *fabliaux* that succeeded the epic, and went to

SIR WALTER SCOTT, BY SIR HENRY RAEBURN, R.A.
(*By permission of T. D. Galpin, Esq.*)

the other extreme of being purely fanciful in character and incident; from the novel of the previous century, which in the hands of Fielding, Smollett, Richardson, had been a pure transcript of contemporary manners; and lastly, of course, from the drama, in the medium of its presentation. It is to this last, however, in the shape which it took in Shakespeare's Histories, that it bears a closer resemblance than to any other. Real and

imaginary personages and events are intermingled in each. Dugald Dalgetty takes part in the actual warfare of Royalist and Parliamentarian, as Falstaff fought, and narrowly escaped death, at Shrewsbury fight. Oliver Proudfute is made to move among historic Scotch barons, just as Ancient Pistol is placed side by side with Harry the King, Bedford and Exeter, Salisbury and Talbot, Warwick and Gloucester, on the field of Agincourt. And it is this, indeed, which has caused Scott to succeed or supplement Shakespeare as the source of all the English history that is known to a large number of the English people, a circumstance which should give the professional historian reason to rejoice that Scott had more reverence for historic truth than his great admirer and the most successful of all the writers inspired by his example, Alexandre Dumas. That splendidly fertile romancer is, however, only one among an innumerable band of followers on a path of literature which was eagerly pursued for some years after Scott's death, and, after a certain slackening of the stream in the third quarter of the present century, has since then been thronged by a band of spirited, and in some cases brilliantly accomplished, writers of the new school of adventurous romance.

The Waverley Novels.

It is impossible within the limits of a work of this description to do more than attempt to fix Scott's place in relation to the development of our prose literature. Detailed criticism of the extraordinary series of romances which began in 1814 with "Waverley," and ended with "Castle Dangerous" the year before his death, would in this place be impossible. Reckoning the three short stories in the first series of the "Chronicles of the Canongate" as one work, they number twenty-seven in all, a figure not much below that of the Shakesperian canon; and if it be true that even the greatest of them fail to attain the Shakesperian level, it might on the other hand be said of all but two or three of them, produced under extremely adverse circumstances, that no succession of imaginative creations maintaining a more consistent and uniform standard of artistic mastery has ever, even by Shakespeare himself, been presented to the world. The gallery of the immortal romancer is hardly less crowded with ever-living figures—heroic, humorous, beautiful, pathetic, terrible—than is the gallery of the immortal dramatist.

Two female novelists—one of considerable, the other of

surpassing merit—may for various reasons be appropriately noticed in immediate succession to Scott. It was to the Irish novels of Maria Edgeworth (1767–1849) that Scott declared himself to be indebted not only for the suggestion, but for the model of his own Scotch romances. The suggestion may, indeed, have been so supplied, but those who have made acquaintance with "Castle Rackrent" and other works of Miss Edgeworth will hardly be disposed to assign to these sketches of Irish life and character, vivid, spirited, and amusing as they are, the place which Scott in his generosity claimed for them.

MARIA EDGEWORTH.
*(From an old engraving.)*

A writer of far greater power, though even she, perhaps, has been too highly extolled by the same enthusiastic eulogist, was Jane Austen (1775–1817), who in strictness of chronology should perhaps have been dealt with in the last chapter of the previous volume, but whose works, long retained in MS., were not published till just upon the close of the period which that chapter covers. The unmeasured praises bestowed upon this extraordinary woman by Macaulay are well known, and not less so is Scott's declaration that, though he could "do the big bow-wow strain like any now going, the exquisite touch which renders commonplace things and characters interesting from the truth of the descriptions and the sentiment" was "denied" to him. Herein he was certainly unjust to a hand which showed itself when the occasion required it as consummate a master of miniature as of fresco; but the self-depreciation aside, Scott did no more than justice to the marvellously

finished portraits of the men and women of her contracted circle which the author of "Pride and Prejudice" has left behind her—portraits so closely resembling, yet so deftly discriminated from, each other, and all alike "bitten in" upon the etching-plate with an acid of the subtlest and most delicately flavoured irony that is to be met with in all literature. The contemporary novel of analysis is as direct a descendant from Miss Austen as is the contemporary romance of adventure from Sir Walter Scott.

REGINALD HUGHES. Painting.

THE years that followed the fall of Napoleon found English art in a somewhat unfortunate position. Portrait-painting was really decaying, though Lawrence (V., p. 592) was in his zenith, and Raeburn (V., p. 591), at times, reflected the grandeur of the masters of the previous century. Wilkie had set the fashion in genre, and to good purpose, while Mulready, Leslie, Collins, and many smaller men, were his rivals or imitators. The historical school was in its normal state of ineffectiveness, being represented by the veteran Benjamin West, by his countryman and feeble imitator Allston, by the still feebler Howard, by Hilton, and by Haydon. Perhaps the ablest of the band was William Hilton, R.A., the son of a little known Lincoln artist, who devoted himself almost exclusively to religious compositions, and many church pictures are by his hand. A certain Italian feeling for grandeur is to be noticed in some of his works, but the inspiration flowed in an attenuated stream. He died in 1839, in his fifty-fourth year.

William Hilton.

Benjamin Robert Haydon.

Benjamin Robert Haydon, born in 1786, was a stronger individuality; and if energy and self-confidence could have supplied the place of genius and industry, a high place in the history of art would have been his. He was a West-countryman, the son of a Plymouth bookseller, and in 1805, at the age of nineteen, was admitted a student at the Academy. Sacred and classical art was his dream. His first picture, commenced in his twenty-first year, was a six-foot canvas, "Joseph and Mary entering on the road to Egypt." His best pictures are not very well known, and are usually genre subjects, like "Reading the Scriptures," or portraits such as "The Times." He was a fair draughtsman, and a coarse but

effective colourist, but his texture is usually very unattractive, and an innate vulgarity mars his efforts at expression. After a stormy life, during which he was more than once in the debtors' prison, he committed suicide in 1846.

It has been said of English painting of this time, that it is often full of talent, and still more frequently of originality,

*Photo. Walker & Cockerell.*

JOSEPH MALLORD WILLIAM TURNER, R.A., BY CHARLES TURNER.
(*National Portrait Gallery.*)

but is essentially deficient in genius. But one great exception must be made. For landscape the period was a golden time.

We have already said a few words of Turner the water-colour painter (Vol. V., p. 783). It is necessary to say something of the painter in oils, and this notwithstanding that he has had the supreme good fortune to have Ruskin for his *vates sacer*. Up to the year 1819 Turner, who had set himself the task of painting light and heaven and earth, water and J. M W Turner.

cloud and atmosphere, in the true colours that the sunshine gives them, was content to follow the methods and to limit himself to the aims of the "former men." First it is Wilson, then it is the Dutchmen, Cuyp and Bol and Vandevelde; then it is Poussin, and finally Claude Lorraine. Such imitations were easy to him; imitation was part of Turner's course of study. The full strength of light, unsifted and unstrained, is not to be found in Turner's models, nor at first in Turner. During the whole of his first period he uses, by preference, a low key of colour, to which all nature is subdued, and employs, also obviously by preference, a somewhat heavy touch. His figures are usually poor, but that of the "Apollo killing the Python" shows that, had he chosen, in this also he could have excelled. In the second period, to quote Ruskin—

"He worked on the principles which during his studentship he had discovered, imitating no one, but endeavouring to do what the then accepted theories of art required of all artists—namely, to produce beautiful compositions or ideals, instead of transcripts of natural fact."

To this period, which is usually considered as represented by the seventeen years between 1819 and 1836, belong his most perfect works—"Childe Harold's Pilgrimage," "The Bay of Baiæ," and that crowning glory of English art, "Ulysses deriding Polyphemus." This is the central and quintessential work of the great painter. In his third period—which, to our view, shows the painter of the second period working without any prevention or restraint—we see him setting down his impressions of Nature just as they came to him: sometimes with violence, sometimes with the most dazzling success: occasionally turning back to the ideals of his earlier time, occasionally spending all his force in accuracy of delineation. The "Apollo and Daphne," "The *Fighting Téméraire* tugged to her last berth," "The Sun of Venice," and "The Burial of Wilkie," are among the *chefs-d'œuvre* of this later time.

It is difficult, even impossible, to sum up in a single chapter, much less in a single paragraph, the contribution of this great genius to the world of art, and so far as it is possible it has been done by Ruskin. It was not only that nobody before Turner had painted mountains in the spirit of the mountains, or seas, still or stormy, in the spirit of the sea, or that he first interpreted for us the redundance of Nature, the infinity of

THE BAY OF BAIÆ; APOLLO AND THE SIBYL, BY J. M. W. TURNER, R.A.
*(National Gallery.)*

cloud perspective, the alluring mystery of distance—he did all this, but he did much more. He was the supreme master of all the splendour, all the magic of the heavens. And all this was done, or mainly done, in that period of intellectual stagnation and formality, the age of the Regency and the reign of George IV. and his successor. And he who brought this revelation to man—for it was nothing short of a revelation—was the son of a poor hairdresser in Maiden Lane, without refinement, without schooling, coarse in his tastes, ungainly in his person, uncouth in his speech; the greatest natural talent, the most lonely and isolated individuality, that the century has produced. After a life of unequalled productiveness in oils, in water-colours, in drawings for the engravers, wealthy beyond his wants and famous beyond his desires, he died in 1851 at the age of seventy-six. It was one of the fancies of this strange great, lonely nature to hide himself on his holidays in some hole or other, and, for his complete security, to go by a feigned name. He was passing under the name of Brooks, as a broken-down sea-captain, and lodging at a riverside cottage at Battersea, when he was seized with his last illness. There was a railed-in roof to the cottage, and as long as he was able the painter whose life had been given to learn the mystery of light and its interpretation, used regularly to drag himself up to gaze at the sunrise. "The sun, it is God," were almost the last words that escaped his lips. Truly a pious man this, according to his creed.

Not only did Turner live his artistic life apart, but the glorious creations of his maturity bear the distinctive marks of an essentially lonely and incommunicable genius. In consequence, his influence on English art, as a whole, has been singularly small, and, indeed, in an inverse ratio to the transcendent greatness of the artist. Quite otherwise has it been with Constable. His, too, was a thoroughly original talent; but he was a great emancipator as well as a great artist, and largely influenced the landscape art not only of his native country, but of France. The amount of the debt may be disputed, but hardly the fact of indebtedness. Other landscape-painters, like Gainsborough, had painted Nature to please themselves, but fate and Constable alone proved strong enough to force recognition from an unappreciative public.

This remarkable man, John Constable, came from Suffolk, and the countryside which he has immortalised was only a dozen miles or so to the south of Gainsborough's. He was born in 1776 at East Bergholt, a village on the Stour, the river whose finely timbered banks so often furnished him with subjects. His father, Golding Constable, who came of a Yorkshire stock, was a wealthy miller. He inherited Flatford and its water-wheel, and acquired by purchase Dedham, which his son's brush was to immortalise. After a rather desultory Constable.

LANDSCAPE, WITH JAQUES AND THE WOUNDED STAG, BY SIR GEORGE H. BEAUMONT.
(*National Gallery.*)

schooling, intended to fit him for orders, and about a year's practical work at the milling business, John was allowed to commence an artistic career. This was due, to some extent, to the good nature of Sir George Beaumont, whose mother resided at Dedham, and kindly introduced the miller's artistic son. He praised some of his drawings, lent him some Girtins to study, and allowed him to copy a favourite Claude. And he did more: he persuaded the elder Constable to allow him to go to London, with introductions from the baronet. It is curious that Sir George Beaumont, whose repute as a critic was then at its height, and who was the most hidebound advocate of the "brown tree" order of landscape, should thus

have been instrumental in forwarding the career of the great naturalist painter, whose sturdy strokes felled "the brown tree" to the earth. But beyond assisting Constable to get to London and introducing him to certain Academicians of small parts, such as Farington, Sir George Beaumont's influence on Constable was, fortunately, *nil*.

It was John Dunthorne, a plumber and glazier, an enthusiast for Nature, and a firm believer in the possibility of painting its broad effects, who was the predominant influence in Constable's early life. From him he received his first lesson in the observation of Nature and acquired the habit of painting in the open air. With the little equipment that Dunthorne could provide, and Sir George Beaumont's introduction, he arrived in London, but his studies had advanced so little by 1797 that, on the retirement of his father's old clerk in that year, he returned to East Bergholt to manage the mills, and this he did without a murmur, although fully believing that it meant the abandonment of his artistic career. In 1799, however, he was back in London, whence he wrote to Dunthorne announcing his admission as a Royal Academy student. Three years later he attracted the attention of West, whose forgotten landscapes were probably his best works, and from whom he received excellent advice and kind encouragement. "Your darks should look like darks of silver" was a precept of his, laid to heart by the young painter. It was in May, 1802, shortly after the exhibition of his first landscape at the Academy, that he wrote to the faithful Dunthorne a letter which is of singular interest, as it is at once an apologia and a dedication of his life. "For the last two years," he says, "I have been running after pictures, and seeking the truth at second hand. I have not endeavoured to represent Nature with the same elevation of mind with which I set out, but have rather tried to make my performances like the work of other men. I shall return to Bergholt, where I shall endeavour to get a pure and unaffected manner of representing the scenes that may employ me. There is little or nothing in the exhibition worth looking up to. There is room for a natural painter."

To this goal he pressed forward from that time to his death, with ever-increasing confidence, and a year later he wrote, "I feel now more than ever a decided conviction that I shall,

THE VALLEY FARM, BY JOHN CONSTABLE, R.A.
(National Gallery.)

some time or other, make some good pictures, pictures that shall be valuable to posterity if I do not reap the benefit of them." So exact a forecast is unique in the history of art, but the way was long, and appreciation came slowly. His friends bought his pictures, and a few brother artists: but for the first ten years of his career he did not sell a single landscape to a stranger. He was not elected an Associate till 1819, or a full Academician till 1829, eight years before his death. He was, unfortunately for his own happiness, morbidly sensitive to the want of appreciation. In his later years, long after he had gained a gold medal in the Paris Exhibition, after he had been received into the full brotherhood of the Academy, and when he felt himself a personage, he said bitterly, "The painter himself is totally unpopular, and will be on this side the grave."

Nevertheless Constable never faltered in the work he had set out to do. He passionately loved the flat country of his youth, the shallow rivers, the rich meadow grass by the lock side, the masses of green elms, the wet leaves tipped with silver under the broad sunlight, the harmonies of grey cloud and drifting showers, the surprises of sunbeams piercing a menacing sky, all the greenness of the dripping woodland, all the freshness of the summer rain. These things, every one of them, he stated simply, lovingly, with all the strength that was in him, and with the most absolute belief in their sufficiency. He has been accused of sameness in his treatment; but it was part of his settled plan to keep on, to use his own phrase, "hammering at the nail." Nature on the banks of the Stour had, he said, taught him to be a painter, and he repaid the debt by immortalising his teacher. "The White Horse," "The Lock," "The Mill" (at Stratford and at Flatford), "Dedham Vale," "The Haywain," "Noon," "The Jumping Horse," "The Valley Farm," are his tribute. Nor, in all the noble series of his works, is he ever more entirely himself than in these home examples. It is interesting to note, however, that his "Salisbury Cathedral from the Meadows" was the picture which he thought conveyed the fullest impression of the compass of his work.

**Constable's Influence.**

Constable was, besides, the most useful of pioneers, for he taught the landscape-painter to go to Nature for his subjects;

"to leave the galleries for a while and look at the creation," and paint such message as it had for him. Thus it has happened that, on both sides of the Channel, he has had, as he would have wished, followers of his principles by the score, but hardly any imitators of his practice. Just as Constable was the first to paint the silver sparkle of the light on the edges of the drenched elm-leaves, so Corot was the first to give the smoky softness of the twittering foliage of the French poplar. When Constable's landscapes received a medal in the Salon, a French critic complained that the influence of these English pictures would ruin French artistic traditions. The answer is the work of that admirable group of artists, among whom were Corot and Millet, Rousseau and Troyon, the school that has immortalised the little forest village of Barbizon.

Nor were Constable's dispraisers found only or chiefly among the foreign critics. At home they laughed at his silvery lights—"Constable's snow" they called it derisively. They jeered, too, at his love of grey and showery weather. "Give me mine ombrella," said Fuseli, "I am going to see a picture of Mr. Gonstable's." Even Ruskin wrote that—

"Constable perceives in a landscape that the grass is wet, and the meadows flat, and the boughs shady; that is to say, about as much as I suppose might in general be apprehended between them by an intelligent fawn and a skylark."

This diatribe contains perhaps the noblest compliment ever paid to a landscape-painter. It goes, moreover, to the root of the matter, for that was exactly what Constable felt, and those unnoticed beauties it was his hope and wish to bring to light. "I love every stile and stump and lane in the village," he said; "as long as I am able to hold a brush I shall never cease to paint them." Hardly recognised, as we have said, as a great artist until the Exhibition in Paris in 1824, Constable died in 1837 at the age of sixty; but the maker of modern landscape had done his work.

Other landscape-painters of the period, whose names cannot be omitted even from this most jejune sketch of early nineteenth century art, were John Linnell and Francis Danby. The attitude of both towards their subject was infinitely less devout, if we may use the phrase, than that of Constable; yet Linnell did to some extent for Surrey what Constable did for Suffolk. John Linnell.

He was born in 1792 in London, and while very young entered the studio of John Varley, the water-colour painter, and had Mulready for a fellow-student. Before he was thirteen he was admitted to the Royal Academy School, where he was a great prize-winner. Three years later his landscape, "Removing Timber in Autumn," obtained a prize of £50 from the British Institution. He was an ardent worker, drawing much from the antique, and, as has been admirably said, "the stringent influence on his mind of the Elgin marbles largely helped to preserve for him an ideal and poetical attitude towards Nature." Notwithstanding his early success he found a very scanty sale for his landscapes, and his house was crowded (as Gainsborough's had been) with canvases that nobody seemed to want. He was thus driven to eke out a living by painting portraits, and Thomas Carlyle, before he was a famous writer, sat to Linnell before he was a famous painter. Curiously enough, his portraits are markedly wanting in idealisation, being tight in execution, literal and prosaic. On the other hand, his landscapes, even the most defective of them—and occasionally he failed totally both in texture and tone—are remarkable for their strongly emotional character. He was born a Baptist, and subsequently became a Plymouth Brother; but he was at all times an ardent theologian, and some of his best pictures, such as "The Eve of the Deluge," with the superb menace of its crimson and orange sky, are in the nature of Biblical illustrations. Though early gaining distinction as a student, he was never a member of the Royal Academy. His name was on the list of aspirants for many years, but he was passed over so frequently that, in disgust, he withdrew his candidature. Many years later, when material success had long been assured, he was invited to allow himself to be proposed again for the Associateship, but he declared himself too old for that probationary honour, and as the rules did not permit a direct election to full membership, he remained outside.

Francis Danby.

A more eccentric personality was that of Francis Danby. He was an Irishman, the son of a small Wexford farmer, whom the Rebellion of 1798 drove into Dublin. In 1820 he made a mark by his highly dramatic (almost melodramatic) "Upas-tree." It is a vivid rendering of the fable that the poison of this terrible tree was obtained by criminals sentenced to death, who

LANDSCAPE, WITH FIGURES, BY JOHN LINNELL.

*(In the possession of W. Y. Baker, Esq., Streatham Hill.)*

risked their forfeited lives to obtain it, and the setting is a dark and precipitous gorge, the bottom encumbered with skeletons, dead men and beasts and birds, all seen under a broken moonlight. This was followed by "Disappointed Love"—a girl meditating suicide, in appropriate surroundings. The pictures by which Danby is, however, best remembered are sunset effects. No man has been more successful in painting the fiery orb of the sun low on the horizon, when the violet rays are cut off by the depth of the moist atmosphere. It was one of these studies that opened the way of fortune to the painter. His "Sunset at Sea after a Storm," with its red, lurid light on the broken waves, where a helpless raft lies tossing, was purchased by Lawrence, and the next year Danby was elected an Associate of the Royal Academy. But a domestic scandal, in which the culpability of the painter is admitted, wrecked his career. He was forced to quit the country, and for twelve years after 1829 he resided in Switzerland. He then returned, but the Academy never forgave his early indiscretion, and he remained a sort of pariah till his death. In this latter time he painted some excellent pictures, one in particular, "The Grave of the Excommunicated," a superb rendering of moonlight, with the deep colour in the interspace of open sky, and the hint of saffron on the racing clouds. At times, too, particularly in dealing with a subject like the "Passage of the Red Sea," where the pillar of fire fairly puts out the sunset, he shows a feeling for the terrible which is rare amongst English artists. He did not die until 1853, but the best of his work was done in the twenties and forties of the present century.

**John Martin.**

To this class of painters, if to any, we suppose that John Martin belongs. Like Bewick and Good and many others, he was a North-countryman. He was born in 1789, and learnt the rudiments of art from an Italian named Musso, who practised at Newcastle as an enamellist and painter of miniatures, with whom he came to London. He, however, soon left his master, prosecuting his studies in absolute solitude, and giving great attention to architectural drawing. He began to exhibit at the Academy as early as 1811. Ten years later he painted the "Belshazzar's Feast," a grandiose perspective of impossible architecture. Thenceforward he painted a series of similar subjects, such as "The Deluge," "The Last Judgment," "Nineveh,"

THE PASSAGE OF THE RED SEA, BY FRANCIS DANBY, R.A.

*(In the possession of His Grace the Duke of Sutherland.)*

etc. There is something very imposing in many of his pictures, although the action and expression of his figures is ill chosen and "bombastic." But his brush-work is inferior, his methods mechanical, and his colouring, as a rule, painfully inharmonious. The best that can be said of this artist, who enjoyed a great reputation in his day, was said by Wilkie, who declared that "although weak in all those points in which he can be compared with other artists, he is eminently strong in what no other artist has attempted." He is best seen in his engravings, particularly where the scale is small; such, for instance, as the illustrations for Milton, where the faulty drawing is less apparent, and there is no colour to be objectionable. It has been suggested that Martin was always slightly mad, and there is much in his work to justify the notion.

**Samuel Prout.**

While Martin, as we have seen, was devoting his best efforts to painting imaginary architecture, the artistic possibilities of the reality were being illustrated by the admirable water-colours of Samuel Prout, and a little later by the work of David Roberts. Prout was a Plymouth lad, and the schoolfellow and companion of Haydon. His first employment was in making drawings for "Picturesque Beauties of England," which was published by one Button. He first exhibited at the Academy in 1804, being then only twenty. At first he seems to have desired to be a marine painter; but his true vocation was towards architecture, and in the years from 1815 to his death, in 1852, he poured forth an innumerable series of studies of Gothic porches and towers, and Venetian and Genoese palaces, of Norman and Breton markets. His work is frequently inaccurate in detail, but he never fails to make a picture.

**David Roberts.**

In the same sequence we must mention David Roberts, the Scotchman, born in 1796, who towers above all the architectural artists of his time. He was the son of a shoemaker, and was bred a house-painter. Thence he advanced to the theatre, where he probably first learnt the knack of painting buildings. It is probable, too, that he acquired in the same rough school his extraordinary skill in selecting the main lines which must be inserted, and in indicating the rest by the most shadowy suggestion. He joined the Society of British Artists in 1824, and two years later sent his first picture to the Academy, which gave him a kind reception. Meanwhile in the pursuit of

1832]

subjects he went even further afield, and from Dryburgh and Melrose we find him going on to Rouen and the Normandy towns, the Low Countries, Spain, and even Morocco. Some of his most famous works, like "The Gateway of the Great Temple,

GATEWAY OF THE GREAT TEMPLE, BAALBEC, BY DAVID ROBERTS, R.A.
(*Walker Art Gallery, Liverpool.*)

Baalbec," and "The Ruins at Philæ," were the result of journeys in Syria and Egypt. Genre.

Of the Scotsman Wilkie we have already spoken (Vol. V. p. 762) as the true founder of genre painting in England, and his work, until he was bitten by the gadfly of the historical school, is the best of its kind. His greatest rival, though his fame has been long on the wane, was the Irishman William

Mulready. Mulready. He was born in county Clare in 1786, the son of a breeches-maker, but the family passed over to London, where the boy attracted the attention of various artists, notably of Banks the sculptor. At fourteen he got his student's ticket for admission to the Academy, and five years later married the sister of John Varley, the water-colourist. His "Fairtime," with the two tipsy countrymen, now in the National Gallery, "The Fight Interrupted," with the beaten school bully, "The Wolf and the Lamb," "Giving a Bite," and "Choosing the Wedding Gown," sufficiently gauge and sample his talent. He was indefatigable in drawing from the life, and many of his studies are masterly in the highest sense. He was also an ingenious designer, as indeed is visible in the famous "Mulready envelope," executed for the Post Office in 1840 (p. 331).

Charles Robert Leslie. Just the opposite may be said of his friend Leslie, who without much feeling for colour, and not a great draughtsman nor a brilliant master of the brush, is still one of the most popular of English artists. This is obviously due to the fact that his works without exception show a feeling for beauty of the most healthy, if not the highest, kind, and an appreciation of humour which is at once entirely sympathetic, yet entirely refined. Indeed, the vulgar element in a subject frequently disappears (not without some loss of dramatic force) in passing through that happy temperament of his; look, for instance, at "Uncle Toby and the Widow Wadman in the Sentry Box," now in the National Gallery. The pure gold of Uncle Toby needs no refining, but the widow—how immensely more refined is Leslie's pencil than Sterne's pen! Charles Robert Leslie, though born in London, was bred in Philadelphia. His parents were poor, and he was apprenticed to a bookseller; but a chance sketch which the boy made of Cooke the tragedian (who was starring in the Quaker city in the character of Richard III.) induced his generous master to get up a subscription to start him as an artist. He was just seventeen when he sailed. The Americans, West and Allston, opened their studios to him; and at the Academy he studied, or idled, under the so-called instruction of Fuseli. His first efforts were in emulation of his countrymen, whose historical pictures were the fashion; but his first great success was with "Sir Roger de Coverley at Church," a subject in exact accord with

his own gentle and humorous spirit. From this time forth a succession of genre pictures, from "Don Quixote," from the comedies of Shakespeare, and from the English, and occasionally the French, humourists occupied his time. He went back to America for a year, but returning in 1834, lived the rest of his life in England. Nor is there any painter of them all whose work, both in its merits and defects, is more thoroughly English

THE PRINCIPAL CHARACTERS OF THE "MERRY WIVES OF WINDSOR," BY C. R. LESLIE, R.A. (*Victoria and Albert Museum.*)

in feeling. He attained full Academical honours in 1826, and after a life of distinguished success he died in 1857, universally beloved.

Gilbert Newton.

With a more delicate sense of colour, but an inferior executant, Gilbert Stuart Newton falls naturally into the place after Leslie. Like Leslie, he came from the other side of the Atlantic, having been born in Halifax in 1795. He came of an artistic stock: his father had practised as a portrait-painter in America. He was a good deal influenced in his choice of subjects by Washington Irving. Many of them are Spanish, such as "Camilla introduced to Gil Blas at the Inn": but he was cosmopolitan in his tastes, and his "Portia and Bassanio" at Kensington and "Yorick and the Grisette" in the National

Gallery, fairly gauge his talent. This, without being at all great, has attractive peculiarities, the chief of which are his keen eye for the subtleties of humour and his real admiration of innocent beauty.

"Out-of-Doors Genre."

Half-way between the painters of landscape and the painters of genre come the painters of what has been conveniently called "out-of-doors genre," that is, of landscape with figures, the figures being introduced not merely to give accent to the landscape, but so as to constitute the predominant interest in the picture. Though not as a rule men of great talent, they form a group of some importance in this period. One such was William Collins, the son of a picture-dealer in Great Titchfield Street, London. He was born in 1788, and so was a few years younger than Wilkie, whose fellow-student he was at the Academy school. The family had a business acquaintance with the ne'er-do-weel Morland, from whom Collins received much instruction, and from whom he doubtless imbibed that strong sympathy with the country and country life that makes his principal charm. His was a little talent, but it was exactly in accord with the humour of his countrymen. His best work was executed between 1812 and 1836, in which last year he made a Continental journey, remaining in Italy nearly two years. This was still more injurious to him than a similar sojourn was to Wilkie, and Collins's later pictures, which include such ambitious subjects as the "Disciples at Emmaus" and "Our Lord among the Doctors of the Temple,' are deplorable.

Thomas Good.

An infinitely sounder talent was that of his contemporary, Thomas S. Good, the son of a Berwick tradesman. It is not known whence came his singular skill. He painted good portraits, including one of Bewick the engraver, and also many specimens of indoor and outdoor genre. His figures are masterly, and for strength of drawing and brilliancy of touch, though the scale he uses is small, he is second to none of his contemporaries. He painted many groups of smugglers, fisherfolk, and the like, in which he brings in, with excellent discretion, the rough cliffs of the Northumbrian coast. He is best seen in these examples, as they permit us to gauge his mastery both over landscape and figures, and the certainty with which he can render atmosphere and textures, the oily surface of a calm sea, the rich dulness of old leather, or the

1832]

silvery haze over the shining sands. Good's artistic gift was, in truth, admirably round and complete; but lacking, as by ill luck it did, both the stimulus of ambition and the goad of poverty, it wasted itself on trifles and in the obscurity of a petty provincial town.

Richard Bonington.

One hardly knows whether England can fairly claim Richard Parker Bonington as one of her artists. But he is one of the rare geniuses that belong wholly to the period under review.

MOUNT ST. MICHAEL, NORMANDY, BY RICHARD PARKER BONINGTON
(*Victoria and Albert Museum.*)

His father was governor of Nottingham Jail, but in 1816, at the age of fifteen, the son was sent to Paris, where later he entered the studio of Gros. His career was of the shortest. In 1824, when he was already famous in Paris, he exhibited a series of Venetian sketches in London, which excited universal admiration. His versatility was amazing, and he has left behind works that are almost masterpieces, both in genre and in landscape. His genre subjects, chiefly taken from French history—episodes in the lives of Henry IV., Francis I., and the like—are of quite singular distinction. Never stagey or melodramatic, he has the finest instinct for naturalness and simplicity of pose, and in these interiors he shows himself a master of

rich colour and of warm atmosphere. But it is as a landscape-painter, even more than as a painter of genre, that Bonington will be always attractive to his countrymen. He is as thorough a *plein-airiste* as Constable, and with a wider sympathy. Storm and sunshine, the gold of Venice in autumn, and the grey of the Channel coast in winter, serve him equally well. His short working life was prolific, and his death, though England first heard his name only three and a half years before he died, was rightly described by Sir Thomas Lawrence as a national misfortune. It was caused by sunstroke, got while sketching in the environs of Paris. He came to London in the hope of recovery, but disease attacked his lungs, and thus the artist of, perhaps, the greatest promise born in England in this century was cut off at the age of twenty-seven.

William Etty.

One of the most singular products of the age was William Etty, who, coming, as it were, from no school, and leaving behind him no followers, succeeded by sheer individual force of will. He was the son of pious Methodist parents, bakers by trade, and was born in York in 1787. A generous uncle, who admired the boy's passion for drawing, brought him to London, and at the age of twenty entered him as a student at the Academy. His first efforts were in landscape, where he had little success, and his attempts at portraiture, even after a year's instruction in Lawrence's studio, were equally futile. Afterwards, as he says in his quaint autobiography—

"When I found that all the great painters of antiquity had become thus great through painting great actions and the human form, I resolved to paint nothing else. And finding God's most glorious work to be *woman*, that all human beauty had been concentrated in her, I resolved to dedicate myself to painting—not the draper's or milliner's work, but God's most glorious work—more than ever had been done before."

No painter was more slow in obtaining success. He never won a prize at the Academy, and it was not until 1821 that he made his mark with "Cleopatra sailing down the Cydnus." He had already been abroad for short periods, but soon after that success he made a long stay in Italy, where his work proved popular amongst the Italians, the Venetians electing him a member of their Academy. At home, however, he was chiefly an artists' favourite. Thus it was Lawrence who bought his "Pandora," and helped him to the Associateship of the Academy, which

he obtained in 1824, and John Martin became the purchaser of his fine picture of "The Combat: Woman pleading for the

YOUTH ON THE PROW AND PLEASURE AT THE HELM,
BY WILLIAM ETTY, R.A.

(*National Gallery.*)

Vanquished." The unpopularity of Etty's pictures—in which, true to his original aim, "woman, not the draper's or milliner's work," was the principal subject—is a curious sign of the times. They often show not only a profound appreciation of sensuous

beauty, but a true feeling for decoration. His flesh, too, is frequently clean and sweet in colour, though somewhat generalised in texture, and looking at this day somewhat wanting in transparency. One may add that his nude figures, his "Heros" and "Andromedas" are singularly inoffensive, and there is not a hint of salacity in the whole series. But English society, which looked to George IV. for its standard of purity and

SUNSET OFF HASTINGS, BY COPLEY FIELDING
(*Victoria and Albert Museum.*)

refinement, seems to have been genuinely shocked at the very moderate realism of the Nonconformist painter.

Water Colour.

The time of the Regency and when George IV. was king was a considerable epoch in the history of water-colour painting. We have already described the art of Samuel Prout, one of its most accomplished exponents, as falling naturally among the painters of architecture But the list of his brother-artists, found at the same time in the maturity of their powers, is long and important. Besides Prout, there is Heapley the figure-painter, John Varley the great teacher, De Wint, Robson, Copley Fielding and David Cox, the early *plein-airistes*, and

Hills the animal-painter. A little later we have Cattermole the draughtsman of dramatic genre, William Henry Hunt the master of still-life, Lewis the great Oriental colourist, and Samuel Palmer. Of these, Prout, Heapley, Hills, Varley, De Wint, Cox, and Fielding were born, all of them, in the first fifteen years of the last quarter of the eighteenth century, while another two decades saw the birth of the rest. Of these, special

THE SIGNBOARD OF THE "ROYAL OAK," BETTWS-Y-COED, 1847, BY DAVID COX.

mention must be made of Copley Fielding and David Cox. The former was a great talent led into overproduction and emptiness by popularity. But seen at his best he is second only to Turner in the rendering of spacious, airy perspective. Fielding and Cox.

David Cox, "the inspired sketcher," is still more eminent, holding, in relation to water-colour, a position analogous to that of Constable in regard to landscape in oils. He was the son of a Birmingham blacksmith, and was preserved, by the fortunate accident of a broken leg, from following his father's

trade. A box of toy paints given to the sick child determined his future career. With a few lessons from one Barker, a local drawing-master, and such hints as he could pick up at the theatre, he rose to be scene-painter in his native town, and in a like capacity served various travelling companies. Tired of this wandering life, he came to London, fell in with Varley, who invited him to his studio. But he himself was in truth his only master. Owing to his imperfect training, exactness of outline and modelling were at all times difficult to him; but he supplied the defects by a masterly precision and harmony of colour, and an exact feeling for mass and the graduated dimness of a far-reaching prospect. The result is that the facts of his landscape swim up out of the haze, like the real things of earth out of the air-clothed distance. His execution is remarkable; for with an unequalled subtlety and perfection of tone, and a poetic imagination guided by infallible taste, is combined the loosest possible handling, in which truth of form is always neglected for truth of generalisation. He has even been compared with Turner himself. But Turner may be said to have mastered the whole range of landscape beauty; the whole earth is his province; Cox is satisfied with one corner, England and Wales, and the beauties of its temperate climate. But within his range he was without a rival. Born in 1788, he lived till 1859, and, working till his death, left behind him a vast body of precious drawings In later years he painted almost entirely at Bettws-y-Coed, in North Wales, finding in that beautiful valley, its steep mountain sides and its foaming torrents, just such inspiration as Constable found in the flat Suffolk plain and the slowly-moving Stour.

H. SUTHERLAND EDWARDS. Music and Society.

Eighty years ago England, without possessing any very eminent composers of her own, was already well in touch with the leading masters of the Continent. Beethoven had just written his Ninth Symphony for the Philharmonic Society, and Weber his *Oberon* for Covent Garden. Rossini had but recently visited London, where he engaged (according to the memoirs of the period) to compose for the King's Theatre an opera, to be entitled *Ugone Re d'Italia*, which, for some unexplained reason, was never finished. London maintained at

1832]

that time two important concert societies—the before-mentioned Philharmonic and the Society of "Antient" Concerts—to give the qualifying word its own significant spelling. Much of the modern music of those days is "antient" now, especially the music of the operatic stage. Rossini had with *Semiramide* just finished his Italian career, and was about to establish himself in Paris, where he was to produce a series of operas, renovated or altogether new, ending with his masterpiece, *Guillaume Tell*. Donizetti and Bellini were as yet unknown, while Meyerbeer was known only as a composer of Italian operas, *Margherita d'Anjou* and *Il Crociato*; the latter work remembered only in the present day as the last in which that highly artificial vocalist, the male soprano, was heard.

King's Theatre

The NOBILITY and GENTRY are respectfully informed, that
TO-MORROW EVENING,
SATURDAY, the 7th of FEBRUARY, 1829,
will be performed, ROSSINI'S new Opera, of
La Donna del Lago
THE PRINCIPAL CHARACTERS BY
Madame PISARONI,
Mademoiselle MONTICELLI,
Madame CASTELLI,
Signor DONZELLI,
Signor DE ANGELI, AND Signor DEVILLE,
Signor CURIONI.

LA SOMNAMBULE.

The whole to be Produced under the Direction of M. DESHAYES.
THE PRINCIPAL CHARACTERS BY
Mademoiselle PAULINE LEBRUN,
Mademoiselle PEAN, Mademoiselle RINALDI,
Madame COPERLI, Mademoiselle PUCCHI,
Mademoiselle PEREZ, Monsieur SIMON,
Monsieur COULON,
Monsieur GOSSELIN, AND Monsieur FREDERIC,
M. SADLER

"IL CONTE ORY,"
NEW DIVERTISEMENT,

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The OPERA will begin on SATURDAY at Half past Seven, and on TUESDAYS at Eight O'Clock precisely. The Doors will be opened One Hour before the Performances.
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ITALIAN OPERA PLAYBILL, KING'S THEATRE.
(*British Museum.*)

The two great concert societies, to both of which it was a distinction to belong, gave between them twelve concerts in the course of the year. At the Italian Opera, of which the King's Theatre (afterwards Her Majesty's) was the scene, there were two performances each week during the season. The subscribers belonged almost exclusively to the aristocracy, and the gatherings between the acts in the so-called *foyer* were assemblies of rank and fashion such as might have taken place, as

the result of invitation, at the house of some great nobleman. The subscribers, all belonging to the same set, did not sell their boxes to outsiders when they were unable themselves to use them. They placed them at the service of friends.

The prices of admission were very moderate compared with those charged in the present day. Stalls had not yet been introduced. But a ticket for the pit cost eight and sixpence if bought in advance, or ten shillings if paid for at the doors on the night of performance. The singers received about a tenth part of what is paid to them now, except in the case of some phenomenal star like Catalani, to whom everything was sacrificed, and who took, by way of remuneration, the whole of the receipts, *minus* such expenditure as was absolutely inevitable, together with a trifling little bit for the unhappy manager, who then, as now, whatever efforts he might make to keep his head above water, was sure to go under at last. No more appropriate phrase could have been put into his mouth than the one assigned to him by a writer on this subject: *Bankrupturus vos salutat!* But the operatic gladiator was a personage so long as the struggle was kept up. He lived sumptuously, and, for a time, was one of the lights of the artistic and fashionable world.

**The Performers**

The singers (who had not yet learned to describe themselves as "artistes") were looked upon in the best society as mountebanks of a superior kind. They were engaged to sing at evening parties, but, far from being allowed to mingle with the guests, were penned off like cattle in their own allotted corner of the room. Rossini, whose first visit on reaching London was, by his Majesty's special desire, to King George IV., could not but be treated with honour wherever he went. Spohr, too, arriving with introductions from some of the most important personages in Europe, treated as equals those whom he could not possibly look upon as his superiors. He ignored the silken cord which separated the singers and musicians from the company whom it was their duty to entertain. But before ignoring it he had noticed its existence, and he speaks of it with amazement in one of his letters from England. It was always let down, too, for Henrietta Sontag, who, besides introductions from members of the Prussian Royal Family, had brought letters to England from Goethe. The old poet admired her on

the public stage, and adored her in private life, telling Eckermann that though it was "a joy to hear her sing," yet that to converse with her was, still more emphatically, a "sweet delight." To the last a passionate worshipper of charming women, he had a correspondent in London who kept him constantly informed as to Sontag's movements, and he heard with satisfaction that she was everywhere and in all kinds of society appreciated at her true worth.

The Social Estimate of Music.

Music, however, in those days, was not thought much of in England. The spirit was still among us of Lord Chesterfield telling his son not to learn to play the fiddle when, by paying money, he could get someone else to play it for him; which is about as sensible as it would be to tell a lover of pictorial art not to paint pictures himself when, at so much apiece, he could get pictures painted for him

In the early part of the century, and even a little later, the study and practice of music was really looked upon as an unworthy occupation for gentlemen, because an unmanly one. Even in the early 'forties an undergraduate at Oxford was hissed, hooted, and put to flight because at a local concert he ventured to play the piano. Now and then a lord came forward as an amateur composer—the Earl of Mornington, for instance, and, again, the Earl of Westmorland. But these were the eccentricities of great noblemen. Besides, they did not play. They hired (though in no Chesterfieldian spirit) musicians to play for them.

Lord Westmorland's most important work in connection with music was the establishment of the Royal Academy, which at once underwent the influence of the recently founded Conservatorium of Leipsic under the direction of Mendelssohn. It was by Mendelssohn himself, rather than by his great music-school, that the influence was exercised. Two, in any case, of the best of our Royal Academy students, William Sterndale Bennett and George Alexander Macfarren, went to Leipsic, where, thanks to Mendelssohn's recognition of their remarkable talent, several of their orchestral compositions were produced at the Gewandhaus concerts. Each of these composers became in due time chief of the institution at which, as young men, they both had studied.

T. G. BONNEY. Geology.

Geology as a science had a long infancy. At the end of the last century it was still far from the adult stage. The year 1815 witnessed an event which produced on the future of the science effects hardly less important than those of the Battle of Waterloo on the future of Europe. This event was the publication of William Smith's Map of the Strata of England and Wales. It was the outcome of more than twenty years of indefatigable labour, undertaken by a simple land surveyor, dependent for a living on his professional earnings. It conducted him to fame and to poverty. At the time when he was engaged on his work geologists were divided into two schools—the one, often called the Neptunists, of which the leader was Karl Werner, the eminent German professor; the other the Vulcanists. These regarded as their founders Dr. James Hutton (Vol. V., p. 566), who died in 1797, and his friend and expositor, Dr. John Playfair, who was still living in 1815. Both were born north of the Tweed, where, however, the disciples of Werner found an able champion in the person of Professor Robert Jameson, who had studied under that master at Freiberg in Saxony.

Smith's Stratigraphical Map, 1815.

Neptunists and Vulcanist.

Werner's leading idea was that "the earth had been originally covered with an ocean, in which the materials of the minerals were dissolved." Out of this ocean he conceived that the various rocks were precipitated, in the same order as that in which he found them in Saxony; hence, "on the retirement of the ocean, certain universal formations spread over all the globe, and assumed at the surface various irregular forms as they consolidated."[1] He had indeed caught a glimpse of a great truth in regard to the chronological grouping of strata, but he had ignored many facts of primary importance, even going so far as to assign to basalt an aqueous origin. Hutton and Playfair, on the contrary, repudiated all cosmological speculations, and sought to make Nature her own interpreter. They explained the past by the present, and appealed to the action of streams and sea, of all the processes of decay and renovation still at work, to account for the geological changes of which the earth's crust bore record. Its history they deemed to extend back into an illimitable past, for it disclosed, as they affirmed, no sign of a beginning,

[1] "Life of Sir R. I. Murchison," by Prof. A. Geikie, vol. i., p. 100.

or forecast of an end. At the date named the Huttonian school certainly had prevailed in England, and it had been strengthened by the foundation of the Geological Society of London, in 1807, with the avowed object of gathering facts as to the composition and structure of the earth, without reference to questions of theory. But the northern teachers of geology—partly, perhaps, owing to local circumstances—had paid little attention either to fossils or to the succession of the rocks established by them: in other words, either to palæontology or to stratigraphy. The impulse towards these was given by the work of William Smith, and they became for many years the chief subjects of study among English geologists.

DR. JOHN PLAYFAIR, BY SIR HENRY RAEBURN, R.A.

(*National Portrait Gallery.*)

The twenty years that succeeded the foundation of the Geological Society was one of great activity and earnest work in the science. This Society numbered among its earliest members a remarkable group of men, most of them still in the prime of life, many of them fortunate in the possession of means ample enough to free them from the fetters of a profession or of business: men such as Buckland, Conybeare, De la Beche, Fitton, Greenough, Francis Horner, MacCulloch, Scrope, Sedgwick, Warburton, Whewell, and Wollaston. These, where not original members, came dropping in during the first dozen years of the Society's history, and were quickly followed by Lyell, Mantell, and Murchison. Though one or two of the first group still adhered to the old ways, and even undervalued palæontology, the majority of them went eagerly along the lines

**Founders of British Geology.**

indicated by William Smith, and addressed themselves to working out in detail those stratigraphical facts which he had drawn in outline with a master's hand. In 1825 a Royal Charter was granted to the Geological Society, and the official recognition thus secured subsequently assumed the more substantial form of giving it a "local habitation" as well as "a name."[1]

At the date of the Society's charter the principal tasks which awaited its members were two in number: one, the extension of William Smith's method of arrangement to the vast masses of rocks underlying the Carboniferous system, rocks which, in other words, were more ancient than those containing the coal-measures. These rocks, though sometimes fossiliferous, were often, and this through great thicknesses, apparently barren of life; they were faulted, folded, affected by disturbances and mineral changes to a much greater extent than was usual with the more recent rocks; they also occurred in less accessible districts; so that the geologist, at first, had considered it the wisest course, on meeting with them, to glance and pass on. He termed these collectively "Transition" rocks, described them as "greywackes," and left them for future work.

Catastrophists and Uniformitarians.

The other task was an extension of the Huttonian principle which its author does not appear to have contemplated. Catastrophic geology, as it is now generally termed, was in vogue during the first quarter of the nineteenth century. It was then generally supposed that this globe had been the scene of a series of catastrophes, each of which had closed a long epoch of comparative repose, had been fatal to all living creatures, and had been followed by a new exercise of creative force. The appearance of man and of the fauna and flora which now exists upon the earth had been heralded by the last of these catastrophes. Such notions served to avert, at any rate to a considerable extent, the denunciations of theologians, who viewed the new science with no little suspicion, owing to the obvious difficulty of reconciling its results with the statements in the book of Genesis; but beyond all doubt the supposed

[1] The Society received apartments at Somerset House in 1828, and was transferred to its present abode in the new buildings of Burlington House in 1874.

necessity of doing this was for a long time a serious impediment to real progress. But as the fossil contents of the earth became better known, and the strata themselves were studied over wider areas, it became more and more difficult to find any place for these epochs of catastrophic destruction, while examination into the action of existing causes made their occurrence not only an unnecessary but also a far less probable assumption. It had been long supposed that the most recent and most superficial terrestrial deposits bore unequivocal testimony to the action of at least one mighty deluge; but in regard to these also a few geologists, more keen-sighted and thoughtful than their neighbours, began to doubt not only the interpretation of the evidence, but also the adequacy of the cause.

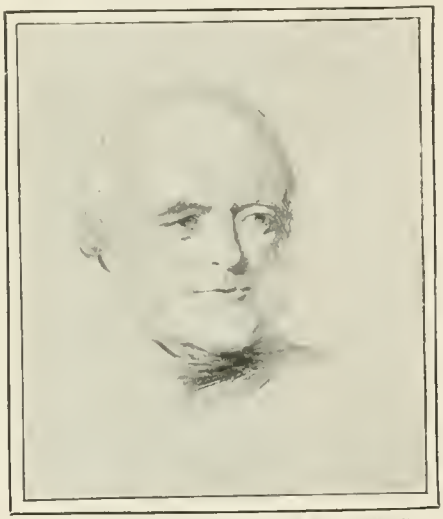


*Photo: Walker & Cockrell.*

SIR CHARLES LYELL, BART., F.R.S., BY GEORGE RICHMOND, R.A.

(*National Portrait Gallery.*)

The leader of this band of sceptics, the man who may claim to have done more than any other in the nineteenth century to purge geology from crude speculation and to vindicate its position as a science, was Charles Lyell, the eldest son of a Forfarshire laird, a young barrister, who joined the Geological Society in 1819, soon after taking his degree at Oxford. He became speedily enthusiastic in working out the succession of the Tertiary deposits, to which William Smith had paid less attention than to the Secondary strata, and in a few years, about 1827, conceived the idea of the book which afterwards established his reputation. This, as he mentions in 1829, was to be entitled "Principles of Geology: being an Attempt to explain the Former Changes of the Earth's Surface by reference to Causes now in Operation." The first volume of the work

Sir Charles Lyell.

appeared in January, 1830, the second just two years later, the third in May, 1833. In order to prove the gradual passage from past geological ages to the present one, it was necessary to study the Tertiary deposits with exceptional care; while to establish the adequacy of existing causes, the effects they were still engaged in producing had to be investigated. For both these purposes travel beyond the limits of the British Isles was necessary. In them the later half of the Tertiary record is extremely imperfect; in them we have no active volcanos or lofty mountains, no glaciers, snow-fields, or large rivers. During the five years, beginning with 1828, while his book was in progress, Lyell devoted nearly one-third of the time to travelling in France, Germany, Switzerland, Italy, and Sicily, besides paying a short visit to an interesting volcanic district in Spain, as well as continuing to make occasional excursions in his own country. It was no light task that lay before him. Almost all the leaders of his science were more or less imbued with catastrophic notions. Scrope, perhaps, of those already named, was the only one who had heartily espoused the "Uniformitarian" creed. But the wealth of illustration, and the sound inductive reasoning exhibited in the "Principles of Geology," aided by its lucid statement and polished style, dealt a blow to catastrophic geology, which ultimately, though somewhat slowly, proved fatal. The month of January, 1830, when the first volume of the "Principles" appeared, may be called not improperly the nativity of Modern Geology.

Sedgwick and Murchison.

But during these years work had been begun in the forbidding region of "greywacke." The first Englishman to seriously address himself to solving the difficulties of the Transition rocks was Adam Sedgwick, Professor of Geology at Cambridge. As his first contribution to this subject, he determined in general outline the nature and succession of the rocks in the Lake District and Western Yorkshire, of which indeed he was a native, for he was born at Dent, near Sedbergh, in 1786. Sedgwick next attacked a still more difficult problem, the geology of North Wales. Beginning the task in 1831 from the northern border of the Principality, he laboured assiduously to bring this region into order, notwithstanding its frequent paucity of fossils, and its ancient flows of lava and beds of tuff, the want of good maps, and sometimes of adequate accommodation. It

was a task of immense difficulty, but in the course of about three years' hard labour it was accomplished so effectually that hardly any changes of real importance have been made in the upward succession which Sedgwick established, from Anglesey as a base.

But the problem was almost simultaneously attacked from

ADAM SEDGWICK, BY THOMAS PHILLIPS, R.A.
*(By permission of J. H. Gurney, Esq., Norwich.)*

another side, and in the opposite direction, by one who had already co-operated with Sedgwick in the important investigation into the Old Red Sandstone of Scotland, during the summer of 1827. Roderick Impey Murchison began on the eastern border of the more central parts of Wales and worked downwards from the Old Red Sandstone, investigating the outcrops of the older rocks as well as some of the deposits of later age in the neighbouring counties of England and extending his researches westward into the Principality so as to traverse the

Cambrian and Silurian.

region south of that in which Sedgwick was at work; in other words, to the south, speaking generally, of a line drawn from Oswestry to the estuary of the Dovey. The results of this work were announced from time to time in communications to scientific societies, and were finally embodied in his classic work, "The Silurian System," which, however, did not appear till the end of 1838. Meanwhile the two friends combined to attack another great mass of "Transition rocks," viz. that constituting the larger part of Devon and Cornwall. This work was carried on at intervals from 1836 to 1839, and resulted in the establishment of the Devonian system of geology. The existence of such a system was inferred on Palæontological grounds by Lonsdale in 1837, and it was substantiated by their investigations; though the explorers themselves were at first reluctant to admit the general parallelism of the rocks beneath the Culm Measures of this part of England (identified with the lower portion of the Carboniferous system) and of the Old Red Sandstone of Scotland and South Wales; ultimately, however, they became convinced of its accuracy and maintained it in their publications.

Difficulties, however, even prior to the publication of "The Silurian System," had already arisen in regard to fitting together the work of Sedgwick and Murchison in Wales—difficulties which doubtless might have been cleared up had the two friends made a joint and thorough examination of the borderland. These became the origin of a dispute which ultimately led, about the year 1854, to a painful and lifelong estrangement. Of this controversy little need now be said. At first sight it seemed one only of nomenclature—viz. whether a certain important series of rocks which Sedgwick had made the upper part of the Cambrian system, as established by him in North Wales, should bear this name, or be designated Lower Silurian —the name given by Murchison to a series in his own region which had since proved to be generally identical with the above-named portion of Sedgwick's Cambrian, instead of overlying it, as had been at first supposed. The nomenclature, however, was held by Sedgwick to involve a principle. He maintained that his Cambrian system was accurate from bottom to top, and this contention has been confirmed in its essentials by all later researches; while his opponent, by confusing the

Caradoc and the Upper Llandovery groups, had missed the great physical break which split his Silurian system into two, and had left the lower part—in which also another serious error had been detected—without any definite base.

It is now very commonly held that the scientific question is best solved by recognising three distinct systems—that is, by restricting the name Silurian to the upper division of Murchison,

SIR RODERICK IMPEY MURCHISON, BY STEPHEN PEARCE.
(*National Portrait Gallery.*)

and Cambrian to the lower and middle divisions of Sedgwick's system, and by conferring a new name, Ordovician, on the part which has been the subject of debate.

Post-Devonian Systems.

Want of space forbids us to enumerate in detail, though it must not be forgotten, the advances which were being made during all this time in perfecting the work of William Smith among the great masses of stratified rock overlying and including the Carboniferous system. In this task also Sedgwick and Murchison had taken a share, the former in papers on the lower part of the New Red Sandstone (with the Magnesian Limestone of North-Eastern England), completed in 1828, and in one on deposits of the same age in parts of Cumberland and Lancashire,

in 1832; the latter in papers on the Lias and Oolites of Scotland and of some of the Western Counties in England, and on the New Red Sandstone of the Midlands. But, meanwhile, Gideon A. Mantell had been labouring at the Chalk and underlying rocks of South-Eastern England, and had discovered those wonderful reptilian remains in the Sussex Weald which were afterwards acquired for the British Museum. Fitton had worked out the puzzling strata between the Gault and the Weald; Lyell, Webster, and other workers were reducing to order the Tertiary deposits; G. B. Greenough had published, in 1820, his well-known map of England and Wales; and the "Outlines of the Geology" of the same region had been described in 1822 by W. B. Conybeare and W. Phillips. John Phillips also, the nephew of William Smith, had published the first volume of his excellent "Geology of Yorkshire" in 1829; W. Lonsdale began work about the same time on the Oolites of Gloucestershire: and almost every part of the kingdom was being assiduously searched for fossils. It must not be supposed that Scotland, the land of Hutton and Playfair, was neglected. J. MacCulloch, an accurate observer and acute reasoner, had been at work there for several years. He published his classic book, "Description of the Western Isles," in 1819, and in 1826 began, in a systematic way, his geological map of Scotland, which, however, was not published till 1836, shortly after its author's death. Lyell, Sedgwick, and Murchison, not to name others, had contributed their quota of Caledonian geology; but Hugh Miller's remarkable discoveries of fossil-fish among the Old Red Sandstone were not made known till near the end of the decade. Ireland, also, had been explored. R. J. Griffith, justly called the father of Irish geology, had published a geological map of Ireland as early as 1812, and was the author of many papers on this subject, but in this country greater difficulties attended geological work.

**The Geological Survey.**

Besides all this, the early years of the third decade of the nineteenth century were signalised, not only by the publication of Lyell's "Principles," but also by the appointment of a staff of workers for the Geological Survey of England and Wales. This was undertaken mainly at the instance of H. T. de la Beche. A little junior to Murchison, he also had held a commission in the army, which he had resigned in 1817 and had devoted himself to science. After a period of study on the Continent he settled

down to geology at home; and then, in consequence of a new Ordnance Survey of England, urged upon the Government the importance of laying upon the maps the geological boundaries,

HUGH MILLER, BY WILLIAM BONNAR, R.S.A.
*(By permission of the family of the late Lieut.-Col. William Miller.)*

himself taking in hand, as an example, Devon and Cornwall. The idea was adopted; a small staff, with funds and quarters equally modest, was placed at his disposal in 1832. As time went on the staff was augmented, the work extended from Great Britain to Ireland, and a Museum of Economic Geology begun, until, in 1851, the Survey was removed to the present handsome

The Royal School of Mines.

building in Jermyn Street, in association with the School of Mines, the organisation of which had been in progress for several years (p. 705). On the death of De la Beche in 1855, Murchison became Director-General, and held the post till he died in 1872. His successor was A. C. Ramsay, who, on retirement in 1881, was followed by A. Geikie (head of the Survey until 1901). The Royal School of Mines had been removed to South Kensington, and its name has been recently changed to the Royal College of Science. Except in one respect, to be mentioned hereafter, the Survey, though it has been sometimes liable to the common frailty—that office is equivalent to inspiration—has done almost inestimable service, by its maps and memoirs, to British geology.

ROBERT STEELE, Chemistry

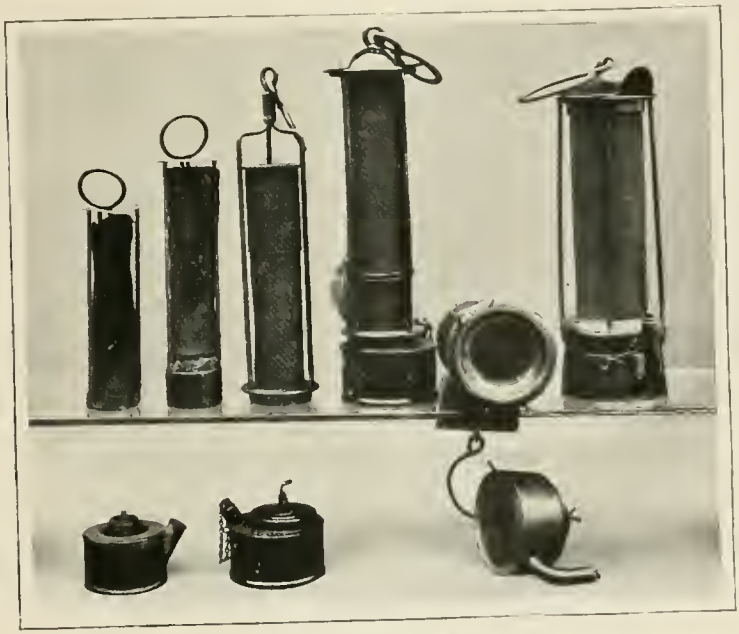
DURING the early years of the century chemistry was the science which, more than any other, influenced men's minds. It had been recognised that knowledge was international, and an honourable rivalry was set up for priority. Berzelius in Sweden, Gay Lussac and Thenard in France, strove for pre-eminence with Davy in England. The great scientific periodicals were founded, and in full working order—the *Annalen der Physik und Chemie* (1790), the *Annales de Chimie et de Physique* (1789), and a few years later the *Philosophical Magazine* (1797–98)—and any new discovery was subjected to the criticism of Europe. The Royal Society and the Institute of France set an example to others of interest in the science, and the happy fortune of the Royal Institution in securing Davy as a lecturer ensured its own success, and directed the attention of the public to a lighter side of science, which it has never lost sight of since. In 1816 Davy dealt a first blow to the doctrine of Lavoisier, that all acids must contain oxygen, by proving that what was then known as oxymuriatic acid contained no oxygen, but was an undecomposed body—chlorine. In 1813 Faraday (p. 254) was appointed an assistant at the Royal Institution, and Brande became Professor of Chemistry on Davy's resignation of the post.

Sir Humphry Davy.

In his earliest lectures at the Royal Institution Davy had laid stress on the connection between science and industry, and some of his finest work was inspired in this way. His lectures on agricultural chemistry lie at the root of all subsequent

1832]

treatises on the subject, and he was the first to insist that agriculture must look to natural science for a solution of its problems. But a still greater example of the debt of industry to science is the invention of the safety lamp (1816: p. 249) in direct response to an appeal from those interested in coal-



DAVY AND STEPHENSON SAFETY LAMPS.
(*Victoria and Albert Museum.*)

mining. With this discovery Davy's active career comes to a close.

On the death of Sir Joseph Banks, Davy was elected President of the Royal Society, Wollaston (V., p. 752) refusing to be put into nomination. While he had made few great discoveries, the volume of Wollaston's work was considerable; his invention of the reflecting goniometer made modern crystallography possible, and the method of working platinum was in the first instance due to him. His cautious criticism was of the greatest service in the long discussions of the atomic theory of Dalton. Wollaston.

Prout's Hypothesis.

In 1815–16 William Prout (1785–1850) published papers on the relation between the atomic weights of the elements and the density of their vapours, in which the tenet was set up that the atomic weights of the elements were multiples of that of hydrogen—the lightest element known. Perhaps an idea from

SIR HUMPHRY DAVY, BY SIR THOMAS LAWRENCE, P.R.A.
(*By permission of the Royal Society.*)

which such weighty theoretical conceptions have arisen has never originated in such a faulty manner. Prout's own investigations are few and of no importance, but the prospect afforded by him of a simple explanation of the problem of the constitution of matter served as a spur to further research, which has since disproved his hypothesis.

Brande (1786–1866), who succeeded Davy at the Royal

Institution, was not a man of great originality. He was concerned with Faraday in the scientific study of coal-gas, and was a well-known writer on chemistry. He founded in 1812 the Society for the Improvement of Animal Chemistry for the study of physiological chemistry. Brande.

Another important work done in this period was Faraday's achievement in 1823 of condensing chlorine and a few other gases. The simplicity of the process and the ability shown in dealing with it marked him off as the only successor to Davy possible; but though he made several important chemical discoveries, and notably that of benzine in the liquor obtained from condensed coal-gas, his future career belongs rather to physics than to chemistry. A new generation was, however, growing up which succeeded to the achievements of Davy and Priestley, Dalton and Faraday, and built on their foundation chemistry as we know it to-day. Faraday's Chemical Work.

MANY events have combined to make the medical history of the nineteenth century remarkable. The restlessness of its opening years was a fitting prelude to the activity which has marked its whole course. The first effect of educating the rank-and-file of the profession was to evoke the critical faculty, to overthrow authority, and to widen the outlook both in medicine and in surgery. The medical practitioners in England at the beginning of this century were the physicians, the surgeons, and the apothecaries; beneath these three recognised classes was a group of nondescript persons calling themselves surgeon-apothecaries, men-midwives, cuppers, tooth-drawers, compounders and dispensers of medicines. The physicians, surgeons, and apothecaries alone had received even the rudiments of a technical education, and had submitted themselves to examination, but they formed the minority of the profession. The host of general practitioners had gained their knowledge empirically, were subject to no controlling body, and were unrecognised by law. D'ARCY POWER. Medicine and Surgery. The Profession.

The first movement in advance came from the ranks of the profession itself. Improved methods of teaching showed the general practitioner his ignorance. The better class amongst them tried to benefit their fellows by making education com- The Apothecaries Act.

pulsory: the baser sort endeavoured to limit competition by establishing legal restrictions to the indiscriminate practice of medicine. The objects of both parties were, therefore, identical though their motives were widely different. The two great corporate bodies of the kingdom were approached, but neither the College of Physicians nor the College of Surgeons was disposed to assist, still less to initiate, any change in the system to which they had been accustomed. Recourse was then had to the Society of Apothecaries, which had long fretted under the controlling action of the College of Physicians. The company was induced to promote a Bill in Parliament, and the Apothecaries Act passed the Legislature on January 15th, 1815. This Act marks a new era of medicine in England, for it ordained that no one should practise as an apothecary in any part of England or Wales without being properly qualified: that the qualification should be ascertained by examination, and that no person should be admitted to the examination unless he had served an apprenticeship to an apothecary of not less than five years, and could bring certificates of a sufficient medical education and of good moral conduct. Unlicensed apothecaries were punished by a fine, and expressly debarred from recovering any charges claimed by them in a court of law. The new Act did not affect chemists or druggists, and the licensing powers of the Universities of Oxford and Cambridge, of the Royal College of Physicians and of the Royal College of Surgeons, were exempted from its provisions. The Act introduced a new and important principle into the practice of medicine, for the State then affirmed it to be necessary for every medical man to give evidence that he possessed a minimum amount of knowledge before he entered upon the practice of his profession. Hitherto, anyone might practise his art unmolested, unless he desired to enter the Army or Navy, so long as he did not encroach upon the privileges of the various corporate bodies in the kingdom. The Society of Apothecaries executed its difficult task with judgment, and a regular system of medical education was soon developed.

Medical Teaching.

The multiplication of the private medical schools was one of the first results of the increased demand for medical education. The schools were officered by able men recruited from all parts of the kingdom, but their success made them

unacceptable to the medical schools attached to the larger hospitals in the metropolis. The teachers in the hospital schools were conservative, and held the highest official positions in the profession. The teachers in the private schools were more progressive; and though they were under the control of the Colleges, who had the power to prescribe the course of study, they had the teaching of the youth who were to become the medical profession. The physicians and surgeons triumphed for a time, and slowly each private school disappeared. The teachers died, too often heartbroken and impoverished, but their pupils survived, and their methods lived and bore fruit, for in due season the Colleges adopted and extended them.

The Anatomy Act.

Anatomy was the first branch of medicine to feel the strain of the new educational requirements. Public and private teachers were alike unanimous in insisting upon a thorough knowledge of the human body as the only true foundation of medicine. Anatomy, too, had the further advantage that, as it had some affinity to an exact science, it was of great value as an educational agent, an advantage it shared with classificatory botany. Anatomy, then, was taught with eagerness, but its practice was attended with the very greatest difficulty. No provision was made by law for dissection; dead bodies had to be obtained by exhumation, conducted either by the teacher and his pupils, or by associated bands of wretches known as resurrectionists, or body-snatchers. These methods led to frightful abuses, which culminated in murder for the sake of obtaining bodies. The atrocious crimes committed at Edinburgh by Burke and Hare in the winter of 1827–28 led to the appointment of a select committee to report to Parliament upon the proper means for securing and rendering legal the practice of anatomy. Evidence was taken in May, 1828, and, after an abortive attempt in March, 1829, the provisions of a simple but effectual Act for regulating schools of anatomy came into force upon 1st August, 1832.

Higher Medical Education.

The closing years of the reign of George IV. were a momentous time in the history of scientific medicine, for the medical profession was then fully awakened to the necessity of providing more than a minimum technical education. The idea of establishing a liberal University in London which should

be free from the trammels of the older universities and teaching bodies had been a favourite idea of the poet Thomas Campbell. The idea became a reality owing to the energy of Mr. (afterwards Sir) Isaac Lyon Goldsmid and of Lord Brougham. Active measures were taken in April, 1825, to found an establishment under the title of the London University, and in the following year seven acres of freehold ground were obtained between Upper Gower Street and the New Road. Mr. Wilkins, R.A., immediately proceeded to erect the present buildings upon the site thus acquired, and professorial work was begun in them in the autumn of 1828. The institution, commenced as a private enterprise, was strong enough to obtain a charter of incorporation in November, 1836. Some opposition, however, having arisen, and King's College having become incorporated in the meantime, a separate charter was granted in the same year to a new body, whose business it was to examine and not to teach. This body, transformed by legislation at the close of the century, obtained, and still retains, the title of London University—whilst the older teaching body in Gower Street became known by its present name of University College. The medical faculty was at first well represented by excellent teachers, but internal dissensions soon drove them out, and for the first few years of its existence the faculty passed through most troublous times. The hospital was founded on September 8th, 1828, as a dispensary, and steps were almost immediately taken to equip it for such clinical teaching as would render it most useful to the medical students presenting themselves for degrees at the London University.

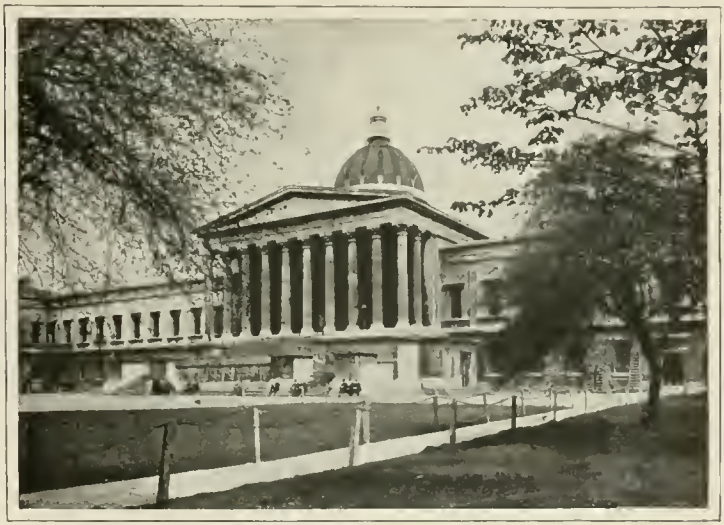
Medicine.

The teaching of medicine up to this date had been most defective in England. London then, as now, had an inexhaustible supply of material for the best clinical teaching, yet students like Robert Christison coming from Edinburgh, where clinical methods were at their best, could not conceal their astonishment at the supineness of the physicians and surgeons attached to the large metropolitan hospitals. Such students made but a short stay here, and, with a keen eye to their own interests, passed on to Paris and Vienna, where clinical medicine and surgery were well taught. A few names, indeed, saved the reputation of the London physicians, and foremost amongst

these was that of Peter Mere Latham, a writer of pure English, the teacher and friend of Sir Thomas Watson.

The revival of medicine was associated with, perhaps in part was due to, the introduction—about the year 1821—of the stethoscope as an aid to diagnosis. Auscultation was soon followed by percussion; both methods came to us from abroad, and, like many great inventions, were received with ridicule. They have revolutionised the practice of medicine, for they

The Stethoscope.



UNIVERSITY COLLEGE, GOWER STREET, LONDON.

render possible an exact diagnosis, and afford information which the older physicians had been obliged to obtain from the aspect and attitude of their patients.

Surgery was in a somewhat better position than medicine during the first quarter of the century. The skill and reputation of Sir Astley Cooper was more than sufficient to maintain our reputation amongst foreign nations, but the surgical acumen of Abernethy, the penetration, the incisiveness, and power of expression of his great pupil Lawrence, and the philosophy of Joseph Henry Green advanced English surgery, and kept alive the traditions handed down from Pott and Hunter. Too much time, however, was wasted by the leaders

Surgery.

both in medicine and in surgery in promoting what appeared to be the interests of the colleges, and in those unprofitable squabbles upon questions of internal economy which have so often proved the ruin of the best minds in our Universities.

Specialism began early in the profession, and somewhat

SIR ASTLEY COOPER, F.R.S.
(*After Sir Thomas Lawrence.*)

Specialism.

earlier in surgery than in medicine. Diseases of the eye seem first to have obtained special attention during the nineteenth century, for the manipulations needed to correct its defects are necessarily more delicate than those required in many other branches of surgery. The Royal London Ophthalmic Hospital was founded as early as 1804, whilst an institution with similar objects was established at Charing Cross in 1816. Orthopædic surgery was next made a special study, and from 1830 it was looked upon as a distinct branch by the surgeons who practised it. Aural surgery became a specialty about the same time, but

laryngology did not come into existence until 1860. It cannot be doubted that the subdivision which still increases in medicine and surgery has had a baneful influence upon our profession. It has destroyed our science, though it has improved our art by giving to individuals that degree of mechanical skill which is to be acquired by repetition.

**Morbid Anatomy.**

It is pleasant to turn from the debased condition of medicine and surgery at this time to the more fertile ground of morbid anatomy and pathology. The leaven of Hunter's influence still worked. Baillie upon the medical side and Stanley in surgical affections made careful and accurate observations upon the anatomy of diseased tissues, whilst Sir Everard Home continued to publish valuable papers of a more philosophical character. The present superstructure of morbid anatomy has been raised upon the foundations thus laid, whilst Brodie and Wardrop, Bright and Hodgkin, Addison, Paget, and Gull, have each in turn added to our stores of knowledge and have rendered possible the most accurate diagnosis. Such additions to knowledge were made formerly by individuals who could be named. It is now our good fortune that they are made by whole classes of men who have banded themselves together into the various pathological societies which are to be found in each of the towns where there is a medical school or a local hospital.

**H. RIDDELL. The Textile Industries 1815-1851.**

THE marvellous change developed in the condition of England since the year 1815 is nowhere more visible than in the manufacture of textiles. Old methods have given place to new; mechanical arts and science have been lavishly called upon in the invention and manufacture of machinery, amazing in the complexity of its construction and in the perfection of the result. This development is the result of many forces, social and economic as well as inventive; but it is rather to the introduction of new processes, methods, and machines, to which attention will be given in the brief summary which follows.

At the beginning of the period under review this improvement in machinery and processes was actively in progress, and has not ceased during the many years which have followed, nor can it be supposed that the limit of skill,

ingenuity, or invention has yet been reached. In the early years of the period the power-loom was just beginning to come into use; the mule had not yet come under the reforming hand of Roberts; nor had Arkwright's slubbing and roving frames been perfected by the adoption of Houldsworth's differential motion. The hand-loom still held its ground. The advantage shown by the power-loom (V., pp. 638, 806) was so small, even so doubtful, that investment of capital in such machines seemed almost certain to result in loss. The number of such looms did not exceed four or five thousand, and experienced observers were hopeless of much increase. A contemporary writer took a most despondent view of the future of the weaving trade. He said—

"Whenever the great current of English twist flows freely into the Indian market, all the exertions to improve the steam-loom will become futile, and all the capital and machinery employed in working it a ruinous speculation. The Indian will obtain our twist, weave it into cloth, return it to England, and, with all our boasted machinery, all our steam-looms and their subordinate preparing machines, will undersell us in our own markets."

The hand-loom then held its ground, and seemed likely to do so indefinitely.

For many reasons the decay of the hand-loom industry must be regretted. It was carried on essentially in the homes of the weavers, providing employment for their wives and children without confining them within a factory, and it could be carried on in conjunction with agriculture. There was no need for the workers to gather into towns, and it was possible to carry on the trade under the most healthy and wholesome conditions. With the extension of power-loom weaving all this was changed. It was impossible to work profitably without collecting a large number of looms into one building, and the conditions which already obtained in the spinning trade became more and more the rule in the weaving. It was but slowly, however, that the hand-looms gave way to their powerful rivals, and that cottage industry was replaced by the factory system.

In considering the advance made by the textile manufacture it may be more interesting, and at the same time more effective, to select a few branches of the trade, and to follow in detail the more important changes and improvements in each. In any such selection the first place

must be given to the cotton trade, whether its importance be measured by the number of workers employed, by the capital invested, or by the total value of the product. The linen industry may be chosen for the second position, affecting Ireland in the main, as the cotton trade does England, while jute may be looked upon as a trade especially belonging to Scotland. Only a small space can be given to the silk and woollen trades, not as of small importance or outside the limits of the subject, but simply because the three trades already mentioned may be considered as sufficiently representative.

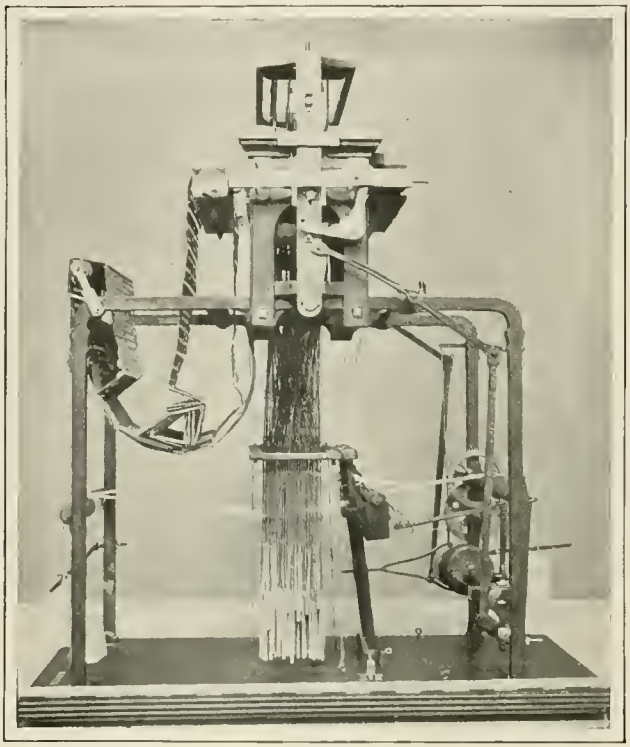
**The Cotton Trade.**

The cotton trade of England had made great advances before the year 1815. The labours of Arkwright and Hargreaves, of Crompton and others, had brought the spinning machinery to a state of very considerable efficiency, and it became necessary to find outlets for the twist which was poured forth so plentifully and, comparatively, so cheaply. For this purpose the power-loom was well adapted, and although its introduction was slow and experimental, yet it was not long after the year 1815 before the advantage in its use became apparent, and factories and looms rapidly multiplied. Thus, while in 1815 there were in England not many more than 3,000 power-looms, five years later the number had grown to 12,000, and by 1825 the new machines numbered 30,000.

**Machine *versus* Hand Labour.**

It was only by the help of improved construction and the inventive skill of many ingenious men that the power-looms obtained the decisive advantage over the old hand-looms. Yet the advance was unchecked, although the hand-loom trade fought hard, and perished slowly. In 1825 it was estimated that there were still in England 250,000 hand-looms. In 1834, when the power-looms in England numbered 100,000, a committee was appointed by the House of Commons to inquire into the impoverished condition of the hand-loom weavers. It had been represented to the House that the trade had fallen off and the workers were reduced to destitution. The evidence given left no doubt whatever of the terrible state of this once prosperous trade. The finer and more skilled branches still survived in comparative prosperity, but the weavers of such goods as common cotton shirtings could no longer earn a living, and those who could turn to no other employment had become miserably poor. The fact was that

their trade was already dead, killed by the extraordinary productive power of the "steam" loom. Each power-loom could turn out more cloth than a hand-loom, and at the same time one weaver could attend several looms. Thus in power-loom weaving one man could produce from six to eight times more



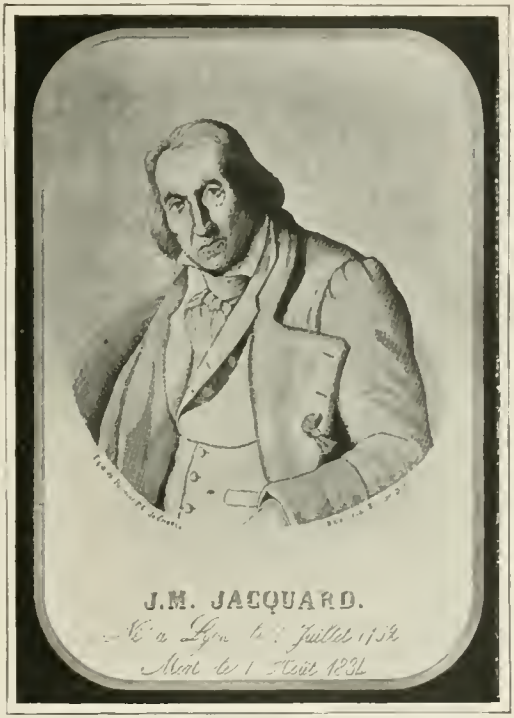
THE JACQUARD APPARATUS.
*(Victoria and Albert Museum.)*

cloth than when employed upon hand work. Production thus cheapened naturally led to increased consumption, and thus reacted upon the spinning trade, which became exceedingly prosperous. In 1815 82,000,000 lbs. of cotton were imported, and by 1830 the import had grown steadily, until in that year it reached 247,000,000.

**The Jacquard Loom.**

The years between 1815 and 1830 were marked by continuous advance in construction and in invention, both in

weaving and in spinning machinery. In 1820 the first mention of the Jacquard machine appears in the patent list. It was this invention which rendered possible the use of the power-loom for goods of really complex patterns, and its introduction into the English weaving industry was an event of the greatest possible




PORTRAIT OF J. M. JACQUARD, WOVEN BY HIS OWN MACHINE.
(*Victoria and Albert Museum*)

importance. Mrs. Dresser is credited with being the first to use this machine in the Coventry silk trade, and being thus the pioneer of the Jacquard in England. Such a valuable invention could not be neglected by her competitors, and the machines soon became common in Coventry, but were not adapted to the power-loom for some years. Improvements in power-looms during these fifteen years relate rather to details of construction, none being of startling importance.

Spinning.

It was quite otherwise in spinning machinery: the years 1823 and 1826 were marked by the first steps in two inventions of revolutionary importance: the differential motion for the slubbing and roving frames, and the self-acting mule.

The Differential Motion.

It is not settled whether to England or America is due the invention of the differential motion, but there seems to be no doubt that Asa Arnold first applied this exceedingly beautiful device to cotton-spinning. It was patented by him in America in 1823, and in England by Houldsworth in 1826 in an improved form. As applied to the slubbing and roving frames by Houldsworth, the invention at once took rank as of the very highest importance. The difficulty encountered and overcome is easily understood. In throstle-spinning machinery the resulting thread is wound upon the bobbin by applying friction to the latter so as to sufficiently retard its motion compared with that of the flyer. Thus it is the thread which drags the bobbin round, and at the same time bears the additional strain of the friction necessary to wind it upon the bobbin. In the preparing frames, known as slubbers or rovers, the bobbins were necessarily large and weighty, and the yarn could not be given twist sufficient to strengthen it, as such twist would render it altogether unsuitable for the succeeding operation. It was therefore necessary to drive the flyer and bobbin independently, and to maintain a proper and exact proportion in their speeds. This involved altering the speed of the bobbin at every reverse of the building motion, as it was necessary to allow for the increasing diameter upon which the yarn was wound. This was accomplished by the differential motion in the neatest and most perfect way, and it is difficult to see how the movement can possibly be improved. Details of construction vary, but the principle of the mechanism is to-day just as it was applied by Houldsworth.

The Self-Acting Mule.

Roberts's invention of the self-acting mule made an even greater advance in the productive capacity of cotton-spinning machinery. Up till this time the hand-mule was the machine most used in spinning wefts, the throstle yarn being much better adapted for strong warps. Indeed, it was impossible to spin weak wefts to advantage in the throstle, owing to the yarn not being sufficiently strong to drag round the bobbin. The cost of spinning wefts of finer numbers was very heavy, being about 5d.

per lb. for 60's. Gradually, however, about 1830, by coupling mules together and applying power to help the spinner with some of the motions, this last was materially reduced. By the introduction of Roberts's mule, self-acting in every movement, the cost became a mere fraction of the 5d., and the effect upon the trade may be easily understood. Roberts took five years to develop and complete his invention, his final patent not appearing until 1831.

RICHARD ROBERTS, AFTER A. RIPPINGILLE.
(*The Royal Museum and Art Galleries, Salford.*)

Richard Roberts was a man of great inventive power, who conferred an enormous boon upon the cotton industry; but, unlike Arkwright, he seems to have been unable to derive personal benefit from his many inventions, and was in poverty at the time of his death. His mule remains unaltered in principle at present, though wonderfully improved in detail.

Many other inventors took part in the improvement of the preparing and spinning machinery; and such men as Whytock, Smith of Deanston, and Evan Leigh contributed much towards its present perfection.

**Improvements, 1830-1851.**

After 1830, and up to 1851, progress in spinning was chiefly obtained by continuous improvement in details of construction and accuracy of adjustment of the machinery employed, and by the steady increase in skill of the workers. In weaving machinery Kenworthy and Bullough made a noteworthy advance in 1841 by introducing the weft stop motion; while the invention of the double-acting Jacquard by Barlow, in 1849, was a real and most important improvement. By careful attention to the details of loom-construction the speed was

greatly increased, and the use of automatic machinery was greatly extended in the manufacture of goods of increasing fineness and complexity.

The progress of the trade was great and continuous. Thus, in 1835 the consumption of cotton was 318,000,000 lb.; in 1840 it had risen to 459,000,000 lb., while in 1851 it reached 659,000,000 lb. The trade had thus increased eightfold in thirty-six years.

There is a common feeling that England has lost by such free exposures of her best machinery and practice at the great Exhibitions, of which 1851 was the first: and there is no doubt that foreign spinners learnt from the English show in Hyde Park, and that valuable hints and ideas were carried home from the centre of the cotton trade. At the same time it is equally true that the English trade gained by the adoption of at least one foreign invention shown, which cheapened and greatly improved the production of fine yarns. This invention was the combing machine of Heillman, and to this extent the cotton trade of England gained by the great Exhibition of 1851.

R. E. PROTHERO. Agriculture, 1802-1832

Up to the close of the eighteenth century, it was the exception, rather than the rule, to find the cultivators of the soil dispossessed of all rights over the land they cultivated (Vol. V., p. 131). The characteristic feature of the period in review is that, within its limits, this exceptional condition became the almost exclusive rule. Between the years 1802 and 1832 the existing system of British farming, by which land is owned by landlords, occupied by tenants, and cultivated by labourers, became practically universal. In this country it has been so long established as to make the present generation forget that, in anything like its present extent, it is not yet a century old.

Revolution in Land Tenure: Enclosures

We have already seen that the immense impulse given at the close of the eighteenth century to enclosures of wastes, commons, and open-field farms reduced a large number of cottagers, copyholders, and cultivators of village farms to the position of wage-dependent labourers (Vol. V., p. 624). In the reign of George III. alone, 6,288,810 acres were enclosed. Economically, there can be no question that the change was advantageous; it was, in fact, demanded by national necessities.

Without it the soil would have remained undeveloped, its natural fertility neglected, its powers of supporting a growing population wasted. It was also urged, and with partial truth, that enclosures were a moral gain, because the commoners were an "idle, wretched class," who relied on a precarious subsistence, eked out by pilfering. On the other hand, it was contended that enclosures depopulated the country districts, and inflicted irreparable injury upon the poorer classes. So far from decreasing the rural population, experience proved that their numbers were rather increased by a change which extended tillage at the expense of pasturage. The real argument against enclosures was the injury they often inflicted on the poor. In 1772 a remarkable pamphlet on "The Advantages and Disadvantages of Inclosing Waste Land" was written by "A Country Gentleman." The writer strongly advocated a change which, as he showed, enormously profited the landlord, the farmer, and the nation. But he also recognised the loss which it inevitably entailed upon the "small common-field farmer," who must necessarily become a "hired labourer." To make the lot of these "reduced farmers" as easy as possible, he recommended that "a sufficient portion of land" should be "laid" to their cottages to enable them to keep a cow or two.

**Effect on the Rural Labourer.**

The predictions of "A Country Gentleman" were remarkably fulfilled, both as to the loss and the gain derived from enclosures. Arthur Young, ardent advocate of the change though he was, lamented its disastrous effect on the general condition of the labouring population. Many of the commoners failed to prove their legal rights; others were assigned too little land to maintain a cow; others were persuaded to sell their allotments before, or after, the award was made; often the allotments were made to the owners and not to the occupiers of the cottages. Sometimes, on the other hand, the interests of the poor were carefully protected, strict legal proof was not required, and sufficient land was allotted for the summer and winter keep of their cattle. Young, in "The Question of Scarcity Plainly Stated" (1800), advises that every scrap of waste and neglected land should be converted into possessions for the poor, and that all labourers should be assigned gardens and grass-land for the keep of one or two cows. Another writer, Thomas Wright, in "The Monopoly of Small Farms a Great Cause of

PART OF OXFORDSHIRE AND BERKSHIRE

*(From the Survey*

IN 1797, SHOWING OPEN FIELDS.

*by K. Davis.*)

the Present Scarcity" (1795), complains that England produced less poultry, eggs, and pigs than formerly, and urges that associations should be formed to purchase large estates, divide them into small farms, and let or sell them to small farmers. But the mischief was already partly done. In 1801 Arthur Young wrote a pamphlet "On Wastes," in which he gives the result of some inquiries that he had instituted into the effect of enclosures. "Many kept cows that have not since," is his frequent summary of results. Out of thirty-seven parishes he found only twelve in which the condition of the poor was improved by the compensation for the loss of their commons. "It is computed," writes the author of "A Plan for Relieving the Rates by Cottage Acres" (1817), "that, since the year 1760, there have been upwards of forty thousand small farms monopolised and consolidated into large ones, and as many cottages annihilated."

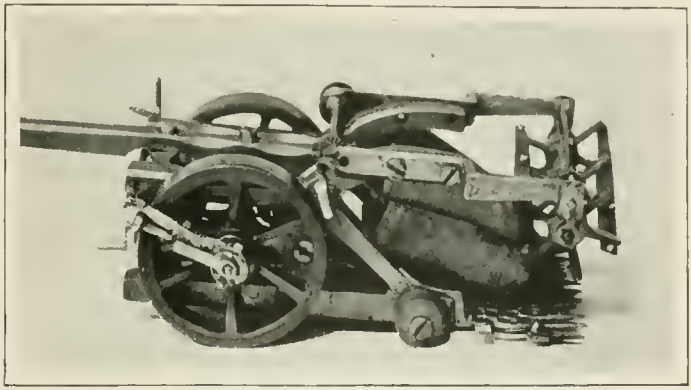
Social Distress.

The sudden displacement of so many cottagers, commoners and open-field farmers, occurred at a difficult crisis. At the moment when they lost the grazing rights on which their existence depended, they also found their domestic industries superseded by manufactured goods. Population was shifting from the south to the north, and old markets were deserted for those which now sprang up round the coal and iron fields. As machinery was introduced, thousands of handicraftsmen were deprived of their livelihood. So long as the French war lasted, the prices of necessaries were doubled, yet wages remained stationary. When peace was proclaimed, the disbanding of soldiers, sailors, and militiamen increased the distress of the rural population. These difficulties were aggravated by the mischievous administration of the Poor Law. The weekly earnings of labourers were supplemented from the rates by allowances for children, and the man with the largest family thus became the cheapest implement for the farmer to employ. Hence, also, single men were thrown upon the rates, and improvident marriages were encouraged. Napoleon was the Triptolemus of British farmers, who found their profits swollen by the Corn Laws, improved markets, and war prices, while their labour bills were paid by the ratepayer. For landlords and tenants the period was one of unprecedented prosperity: for wage-earning labourers it was one of almost unparalleled misery.

The reclamation of heaths and commons demanded a vast

expenditure of capital. An equally large outlay was required to restore fertility to the barbarously cropped and impoverished open fields. But land was a profitable investment, and money was poured into farming. Large landlords, like Mr. Coke of Holkham, Lord Rockingham at Wentworth, the Duke of Bedford at Woburn, Lord Egremont at Petworth, Lord Kames and Sir John Sinclair in Scotland, put themselves at the head of the movement of agricultural enterprise. The King rejoiced

**The Advance in Farming.**



MODEL OF THE REV. PATRICK BELL'S REAPING MACHINE 1826
(*Victoria and Albert Museum.*)

in the title of "Farmer George," contributed articles, under the signature of Ralph Robinson, to Young's "Annals of Agriculture," kept his model farm at Windsor, and experimented in stock-breeding. Fox, even in Paris, considered whether the weather was favourable to his turnips at St. Anne's Hill, and Burke conducted experiments in carrots as a field crop on his farm at Beaconsfield. Men kept their eyes open for every new book which appeared on the subject of farming, and Miss Edgeworth's volume on "Irish Bulls" was ordered by the secretary of an agricultural society as soon as it appeared. Nor were the clergy less enthusiastic. An archdeacon, finding the churchyard cultivated for turnips, remarked to the rector, "This must not occur again." The reply, "Oh, no! Mr. Archdeacon, it will be barley next year," shows that, whatever were the shortcomings of the Church in the eighteenth century, her clergy were at least alive to the importance of a proper rotation of crops.

Agricultural Enterprise.

In every department of agriculture a new spirit of energy and enterprise was manifest. Rents rose, but the profits of farmers outstripped the rise. New crops were introduced: swedes, kohlrabi, prickly comfrey, mangel-wurzel, were readily adopted by a new race of agriculturists. New implements were introduced; Small's plough, Meikle's thrashing-machine economised labour, while patents were taken out, between 1788 and 1816, for reaping, mowing, winnowing, and haymaking machines, as well as for chaff-cutters, scarifiers, turnip-slicers, food-crushers, and other mechanical aids to agriculture. Cattle-shows and ploughing matches were held throughout the country. Farmers' clubs and provincial societies were established. The Bath and West of England Society was founded in 1777, the Highland Society in 1784, the Smithfield Club in 1793. In the latter year the Board of Agriculture was established, with Sir John Sinclair as president and Arthur Young as secretary, and did useful service by diffusing knowledge of the best agricultural practices, as well as by conducting statistical surveys of the farming of the whole country.

The early part of the period under review was one of progress and prosperity. Under the stimulus of high prices new land was brought into cultivation, and to obtain an arable surface no labour or expense was spared. The new system of large landlords, large farms, long leases, and large capital was firmly established, and found in Coke of Holkham its most sagacious and practical champion. His estate-management, farm buildings and cottages were the model of other landlords; his sheep-shearings were meeting-places for practical and theoretical agriculturists, for farmers of every district, and breeders of every kind of stock.

Coke's Improvements. Wheat Growing.

In 1776 Coke came into his estate, with "the King of Denmark as his nearest neighbour." Excluded by his politics from Court and Parliament, he devoted all his energies to farming. He reaped a rich reward. Dr. Rigby, writing in 1816, stated that the rental of the Holkham estate rose from £2,200 in 1776 to £20,000 in 1816. When Coke took his farm in hand he determined that he would grow wheat on the sandy soil, which then yielded only a thin crop of rye, and a bare subsistence for a few milch cows and Norfolk sheep. He marled his land, purchased large quantities of manure, trebled

his live-stock, and in nine years attained his object. A Yorkshire foxhunter in 1772 accidentally discovered the value of bones as manure, and Coke at once realised the importance of the new fertiliser. He also introduced into the country oil-cake

THOMAS COKE OF HOLKHAM, BY T. GAINSBOROUGH, R.A.
*(By permission of the Right Hon. the Earl of Leicester.)*

and other artificial foods, which, with the addition of turnips, enabled Norfolk farms to carry more live-stock. He set the example of stall-feeding and the grass lands on which our ancestors had fed their beef and mutton were deserted for the Eastern Counties. Without deep drainage heavy rich lands could not compete with the lighter soils under the new system: Cattle.

and the older, but inferior, implement was discarded. The Norfolk fairs were crowded with half-fed Galloway Scots, Highlanders, Lowland Scots, and Skye cattle, as well as beasts from less remote districts, which were fattened in the Eastern Counties for the London markets. Thus the Flemish proverb proved true of Coke's farming: *Point de fourrage, point de bestiaux; sans bestiaux, aucun engrais; sans engrais, nulle récolte.*[1] Nowhere in Europe were the grain crops heavier than in the Eastern Counties, because nowhere did the farmer command so abundant a wealth of manure.

Pasture.

Nor did Coke neglect the improvement of pasture. The Society for the Encouragement of Arts, Manufactures and Commerce had, in the middle of the eighteenth century, offered prizes for the cleanest meadows, in which were grown only the best sorts of grasses. Stillingfleet, in 1760, had distinguished the good and worthless herbage by excellent illustrations of the various kinds that were calculated to produce the sweetest hay and richest pasture. Yet Arthur Young, in his "Rural Economy," laments the neglect with which grass lands were treated. Here again the want of deep drainage was severely felt: the wet pastures favoured the growth of the coarsest and rankest vegetation. If land wanted seeding, farmers threw on the ground an indiscriminate collection of seeds, which often contained as much rank weed or coarse grass as nutritious herbage. Coke was the first practical farmer who appreciated the value of distinguishing between the various kinds. To the children of his tenantry he gave simple botanical lessons during May and June, when the grass was in bloom, and employed them to scour the country in search of the best stock of seed. Even as meadows and pastures, the light lands of Norfolk began to beat the undrained grass-lands of other counties, in spite of their natural superiority in richness, out of the market.

Landlord and Tenant.

Convinced of the community of interest that exists between landlord and tenant, Coke encouraged his farmers to put more capital into their land, stimulated their enterprise, and assisted them to take advantage of every new improvement or discovery. By offering leases for twenty-one years he secured to his tenants a return for their outlay, while, by inserting clauses of management, and covenants for the adoption of the Norfolk

[1] "No fodder, no beasts; no beasts, no manure; no manure, no crop."

system of husbandry, he protected his land against impoverishment by excessive cropping. The "Practical Norfolk farmer" (1808) holds up Coke's example as in this respect especially worthy of imitation. "In vain," he says, "are Acts passed for the inclosing heaths and commons, if the old cultivated lands are suffered to remain, by this bar to improvement of having no leases, in a state of semi-cultivation." Though long leases and clauses of management were innovations, Holkham farms commanded the pick of English tenants. Cobbett was no friend to landlords: but even he acknowledged the benefit which

HOLKHAM HALL, NORFOLK.
(*By permission of the Right Hon. the Earl of Leicester.*)

the tenantry derived from Coke's paternal rule. "Every one," he wrote in 1818, "made use of the expressions towards him which affectionate children use towards their parents."

The useful work which Arthur Young had done in disseminating the latest improvements in farming practice has been already noticed. Mr. Coke followed in the same path. The Holkham sheep-shearings did much to break down prejudices and diffuse knowledge, and similar meetings were organised in other parts of the county by such landlords as the Duke of Bedford and Lord Egremont. The Holkham meetings began in 1778, when Mr. Coke, then himself ignorant of farming matters, gathered parties of farmers to his house to aid him with their experience. From that time forward the gatherings were held annually. Dr.

The Holkham Meetings.

Rigby in 1818 describes one of these meetings, when open house was kept for a week, and hundreds of persons assembled from all parts of Europe and America. The mornings were spent in inspecting the farm buildings, the crops and the stock; at three o'clock six hundred persons sat down to dinner, and spent the rest of the day in speeches and toasts

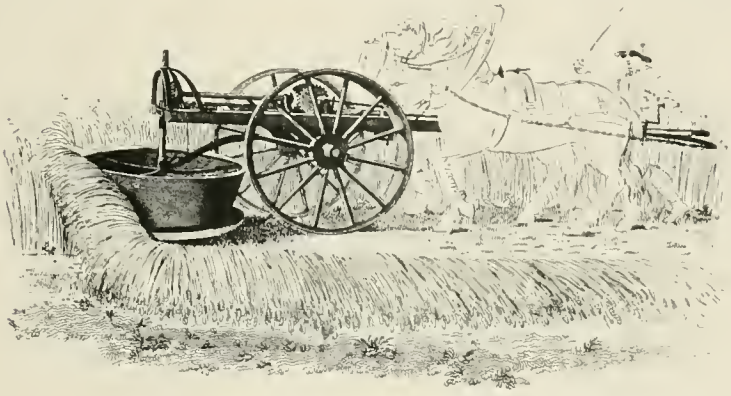
**The Fall in Prices.**

The close of the Napoleonic War in 1815 terminated the period of agricultural progress and prosperity. It was followed by twenty years of almost unexampled adversity. Contracts of all kinds had been made in the expectation that the inflated prices of the war would continue to prevail. When these fell, landlords and tenants, who had borrowed capital, were confronted with wholesale ruin. Land had sold for exorbitant sums: reckless competition for farms had produced excessive rentals: extravagant standards of living, undue expenditure on buildings, had been the result of inflated prices; heavy mortgages had been charged on estates to meet annuities, legacies and portions, which falls in prices rendered improvident and disproportionate; invaluable pasture, which had been ploughed up in years when wheat rose to 115s. the quarter, was ruined. War prices and the Corn Laws made farming almost a gambling speculation: the wheat area alternately swelled and contracted: violent fluctuations in the purchasing power of money accentuated the depression, which resulted in widespread distress among both landlords and tenants, and aggravated the bitter discontent of the agricultural labourer. The table of the House of Commons groaned under petitions for relief. Select Committees sate to investigate the crisis in 1820, 1821, 1822, 1833, and 1836. The evidence shows that the loss had been enormous. It could scarcely have been otherwise when prices dropped, between January, 1819, and July, 1822, in the following proportions: Wheat (per quarter), from 74s. to 43s.; beef (per stone), from 4s. 6d. to 2s. 5d.; mutton (per stone), from 5s. 8d. to 2s. 2d. To increase the misery, in 1810, 1824, and 1830–1 the rot swept off vast numbers of sheep: in the latter year it is stated that two million perished. Richard Preston, M.P., writing on "The State of the Nation," in 1816, says that some of the best estates of the kingdom were selling at a depreciation of 50 per cent., and that one of the finest grass farms in Somersetshire sold at ten years' purchase. Evidence given before the Select Committee in 1833

shows that landlords had lost nine millions, by reductions alone, on their rentals of previous years: that many farmers had lost all they had, and were working on the road; that in the weald of Kent and Sussex there was not one solvent tenant.

The Yeomanry Disappear.

It was during this disastrous period that the old yeomanry practically disappeared. More substantial than the open-field farmers or cottagers, they had maintained the struggle for existence with more tenacity. The evidence of the Agricultural Commission of 1833 proves that they still existed in almost



REAPING MACHINE INVENTED BY JAMES SMITH OF DEANSTON.
(*Farmer's Magazine*," *Edinburgh*, 1816.)

every county; but their numbers had greatly diminished. The causes of their disappearance are not difficult to discover.

Lambard, in his "Perambulation of Kent" (1576), says:—

"A man may find sundry yeomen (although otherwise for wealth comparable with many of the gentler sort) that will not yet for all that change their condition, nor desire to be apparayled with the title of Gentrie."

More than a century later the *Spectator* thus describes a member of the same class:—

"He is a yeoman of about one hundred pounds a year, an honest man; he is put within the Game Act, and qualified to kill a hare or a pheasant: he knocks down a dinner with his gun once or twice a week, and by that means lives much cheaper than those who have not so good an estate as himself. He would be a good neighbour if he did not destroy so many partridges; in short, he is a very sensible man, shoots flying, and has been several times foreman of the petty jury."

Towards the close of the eighteenth century men of this class were still prosperous. In Hampshire, Vancouver (1813) says that there were many farmers who were also "possessors of small estates which their thrifty management keep upon the increase." In Kent, Boys (1793) says that "the number of the yeomanry of this county seems annually on the increase. There is no description of persons who can afford to give so much money for the purchase of an estate as those who buy for their own occupation. Many estates in the eastern part of the county have been so sold, within these few years, for forty, and some for fifty, years' purchase, and upwards." In Essex (1807) land was bought up by the farmers, so that "there is a prospect of the tenure of land returning to the conditions of the seventeenth century, when the county was filled with small gentry residing upon their estates." In Berkshire (1813), Mavor reports that one-third of the soil was cultivated by the owners themselves in small estates. In Norfolk (1804) there was said to be an increasing number of small estates. In Suffolk (1794) numerous yeomen flourished, cultivating estates of value rising from a hundred to four hundred pounds a year.

Similar evidence might be gathered from other counties to show that the yeomanry had weathered the storm of enclosures. But during the French war a very large number had consulted their pecuniary interests by selling their estates at the fancy prices which then prevailed. Those who retained their properties too often mortgaged their land to make provision for their children, to increase or improve their estate, or to erect farm buildings. When prices fell after the peace, the debt remained. The struggle was brief. Their farming deteriorated, their buildings fell out of repair, and finally their estates were sold. The new purchasers were not small capitalists, but neighbouring landlords, or successful merchants. In Yorkshire, for example, if one small freeholder went, his place, in former years, was taken by another; after 1820 this ceased to be the case. In Kent and Sussex, again, many freeholders retained their land by vigorous economy and by wholly ceasing to employ labour; but all who had mortgages or annuities to pay were forced to sell.

**The Effect on Agriculture.**

The change is on social grounds deplorable enough; but, at the time, both economically and commercially, the nation

gained. Without capitalist landlords, agriculture could not have recovered from the prolonged misery of 1818–36, and its rapid revival was due to the new conditions of British landownership, which the nineteenth century saw firmly established and daily becoming the almost universal system.

J. E. SYMES. The Social Economy.

THE war had severely strained national resources. Probably one out of every six adult males served in the army, navy, or militia, yet the exhaustion of men was perhaps less felt than the exhaustion of wealth. In 1778, Hume, the acutest of living observers, thought that the size of the National Debt threatened the very existence of the nation. Since then the debt had more than trebled. In 1792 it was less than two hundred and forty millions. In 1815 it exceeded eight hundred and sixty millions.

**Effects of the Industrial Revolution.**

There can be no doubt that it was the Industrial Revolution (Vol. V., p. 816 *seq.*) that enabled our country to bear the great burden of the war. Under its influence England had ceased to be a mainly agricultural nation, and big towns with factories and workshops had suddenly sprung up. Manchester had already 140,000 people; Birmingham 80,000; Sheffield and Leeds each about 50,000. These numbers do not sound very impressive to us: but we must remember that only a century earlier Manchester was scarcely more than a village, with only 12,000 inhabitants. The total population of England and Wales had risen, in spite of the war, from eight and a half millions in 1790 to about eleven millions in 1815, and the nation's wealth had increased even more rapidly. The wage-earning classes had, however, gained little advantage from this increase. Their wages had seldom risen proportionally to the prices which they had to pay for the necessaries of life. The new wealth which the manufacturing industries were creating provided a fund from which the expenses of the war were defrayed. It was those classes that had profited by the industrial revolution who advanced the successive loans; though the masses had to bear a large share of the burden of paying the interest on these loans. They escaped, indeed, the income tax, which had now risen to two shillings in the pound; but indirect taxes were imposed on many of the necessaries of life. Bread, boots, and salt may be taken as specimens of the things that were taxed.

**Social Conditions in 1815.**

The Landed Interest.

The most prosperous class, at the close of the war, was what was described as "the landed interest." Every improvement in manufacture had tended to raise rents. Every increase in population had operated in the same direction, while the war had helped to keep up the price of food. The farmers shared in the landlord's prosperity. Their rents were seldom raised to the full amount of the increased value of the land, and when they held their farms on lease, they were able to gain the whole increment, till such time as the lease expired. They were naturally disposed to support a war which kept up agricultural prices, and protected them from foreign competition.

Employers.

The large manufacturers were also fairly prosperous. The war was a heavy burden on them, but the Industrial Revolution enabled them, in many cases, to build up considerable fortunes, by availing themselves of division of labour, and other advantages of production on a large scale. The gradual introduction of steam power, and other improvements in cotton and wool spinning, more especially the introduction of the power-loom (p. 97), gave great advantages to those who were shrewd enough to avail themselves of these discoveries, and who possessed, at the same time, exceptional ability for the organisation of labour.

Employed.

Thus, landlords, farmers, and large manufacturers were prosperous, but the bulk of the people suffered greatly during the war. In 1801 we find cotton spinners working seventy-four hours a week for thirty-two shillings and sixpence, which, at the then existing prices, was a miserable pittance. The quartern loaf cost one and tenpence, and butter was two shillings a pound. Many were driven to substitute shell-fish for meat. Some ate nettles and weeds, often without salt, for salt was taxed fifteen shillings a bushel. Nevertheless, as long as the war lasted, popular discontent was partly kept in check by patriotic feelings and by the hope of better days when peace was restored. Reviews, illuminations in celebration of victories, the public funerals of soldiers, and the thanksgiving services in the churches, helped to keep up enthusiasm, and to restrain dissatisfaction.

Condition of the People, 1815-1821.

At length came the long-expected peace, but it brought in its train little or no alleviation of the general misery. In fact, from the almost universal complaints of bad trade and lack of employment, we should gather that the early years of the peace actually aggravated the sufferings of the masses. Some

1832]

allowance must, no doubt, be made for a natural reaction. The cessation of war had been so hopefully looked forward to, that, if it brought no alleviation of poverty, it was almost certain that people would think and say that things were actually worse. Nevertheless, after due allowance for this, the balance of evidence seems to show that the country suffered more during the years 1815–21 than during the war.

THE SCALES OF JUSTICE REVERSED.
(*From a caricature by George Cruikshank.*)

The Unemployed.

Various explanations have been given of this state of things. It is evident that the restoration of peace cut off the demand for certain kinds of labour. The need of soldiers and sailors, and of all the industries that minister to war, was of course much diminished. No doubt the demand for unproductive labour does, in the long run, impoverish a nation. If men are withdrawn from manufacture and agriculture, and employed in taking other men's lives, the resources of the nation are diminished, but this loss may mainly fall on the well-to-do classes, especially if, as in this case, the expenditure is largely met by loans. At the declaration of peace a number of men were suddenly thrown on the labour market who could only gradually be absorbed in productive work, especially as the

nation had been depleted of capital by the war, and had besides to meet the interest on the heavy debt it had incurred. A great and sudden change in the character of the demand for labour is generally for a time injurious, even where it is in the long run beneficial.

The injury done to the landed interest by the increased importation of foreign produce and the fall of prices is another illustration of the same fact. Consumers profited by the change, and gradually part of the labour and capital that would otherwise have been devoted to agriculture was directed towards the supplying of manufactured comforts and luxuries: but for some years the injury done to agriculture probably considerably overbalanced the advantages gained by the consumers (p. 112). The Corn Law of 1815 (p. 2) was afterwards modified, but even after modification it was most disastrous to England. Nevertheless, it is open to doubt whether, in the critical early years of the peace, it did not prevent more injury than it caused.

**Foreign Trade.**

The manufacturing class might have been expected to reap the greatest and most immediate harvest from the peace, and, as a matter of fact, we find that in 1815 their exports rose in value from forty-five to fifty-one millions; but it was soon seen that English manufacturers and merchants had over-estimated the foreign demand. The Continent was (even more than England) impoverished by the great war, and in many cases there proved to be no customers, at remunerative prices, for British goods. In Holland, for instance, our exports were actually sold at lower prices than they would have fetched in London. The protective policy of the Legislature aggravated the evil. In the long run exports are mainly paid for by imports, but the British Government deliberately hindered importation by heavy customs duties. The only branch of our trade that flourished during these years was that with America, largely because there were no protective duties against American cotton. The quantity of this commodity imported[1] rose from eighty-six million pounds weight in 1816 to one hundred and sixteen millions in 1817, and one hundred and sixty-two millions in 1818, while in 1831 it was upwards of two hundred and fifty-seven million pounds; and, as was natural, our export trade to America similarly increased.

[1 After allowing for the quantities re-exported to foreign countries. Baines, *History of the County Palatine of Lancashire*, Vol. II., p. 496.]

1832]

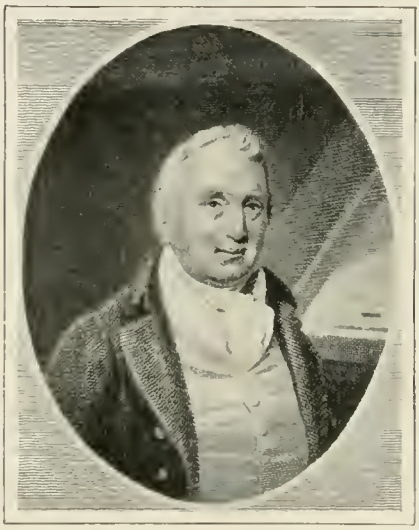
Another cause of the misery of the masses during the early years of the peace was the lack of organisation. The medieval and post-medieval organisations of labour had broken down under the industrial revolution (Vol. V., p. 816 *seq.*). The age of Factory Acts, and similar legislative organisations, had not yet begun, and trade unionism was still in its infancy. Till the eighteenth century an artisan, if he were a man of skill and industry, rose in time to be a master workman. There was no permanent combination of operatives for the purpose of improving and regulating the condition of their employment. Gradually, however, there grew up a class of skilled workmen who were practically certain to remain workmen all their lives. Improvements in machinery and the rapidly growing employment of steam power made the possession of capital almost indispensable for the employing class. In other words, in many trades the workers found themselves cut off from the hope of ever becoming employers or directors of industry. Hence it was that the eighteenth century saw the rise of enduring combinations of the employed. The ruling classes watched the movement with suspicion, and in 1799 and 1800 Acts were passed definitely forbidding trade combinations. The theory still survived that wages should be fixed, not by individuals, nor by collective bargaining, but by the intervention of the justices. But with the growing complexity of industry, this was becoming more and more impracticable, and the spread of the doctrines of Adam Smith tended to discredit the idea of State interference with labour. As early as 1808 a Committee of Parliament reported that a proposal to fix a minimum wage "was inadmissible in principle . . . and if practicable, would be productive of the most fatal consequences"; and in 1813 the law empowering justices to fix the rate of wages was formally repealed, and the other remnants of medieval organisation were swept away in the following years. Thus workmen were told in effect that the State would not help them, and that they might not combine to help themselves. They naturally resorted to violence and riots. The bad harvest of 1816 was followed by much destruction of machinery, burning of hayricks, plundering of shops, and other disorderly proceedings, which only tended in the long run to increase the general distress.

The Disorganisation of Labour

This was clearly perceived by the more intelligent of those

Radical Reformers.

who regarded the poor as wronged and oppressed. Foremost amongst these was William Cobbett, whose *Weekly Political Register*, originally published at a shilling and a halfpenny, began in 1816 to appear at twopence. This may be regarded as the beginning of the modern cheap Press (p. 43). Cobbett achieved the great result of convincing the more thoughtful of the working classes that the root of the evils from which they were suffering was planted in misgovernment, and that their remedy was to be found, not in rioting and machine-breaking, but in sound legislation, for which the way must be prepared by Parliamentary reform. So great was his success that, when the national distress was at its worst, violence almost ceased and a peaceful agitation took its place. "Hampden Clubs" began to be founded in many parts of the country. Working men orators and working men poets began to appear, calling on their comrades to organise themselves, and to demand annual Parliaments and universal suffrage. Sir Francis Burdett, Member for Westminster, was chairman of the London Hampden Club, and was supported by Lord Cochrane, and several of the upper and middle classes.



WILLIAM COBBETT.
(*From an old engraving.*)

Socialistic Reformers.

There were also some organisations of a more advanced type. A Yorkshire schoolmaster, named Spence, had some years previously propounded the theory of the nationalisation of land as the true cure for poverty, and in 1816 this theory was taken up by a band of persons who called themselves the Spencean philanthropists. Some of them were pronounced Socialists, and in favour of resorting to physical force (p. 2). The Government employed spies to encourage violent proposals, and then to give

evidence against those who embraced them, but on the whole, the agitation, like that of Cobbett, was of a peaceful character, and the patience with which the poor endured their misery was remarkable.

The Old Poor Laws.

The social evils were undoubtedly aggravated by the Poor Laws, which encouraged improvidence, kept down wages, and wasted large sums of public money. This subject, however, must be reserved till a later chapter (p. 300).

Currency Contraction.

The last cause we shall mention of the misery of the early years of the Peace is the contraction of the currency, and the consequent fall of prices. Since 1797 the Bank of England notes had been inconvertible, and since 1808 they had been issued to such an amount as to put gold at a premium. By 1817 the premium had so fallen that the Bank undertook to redeem a portion of their smaller notes at par. Later on in the same year the offer was extended, but the Bank found much difficulty in meeting its engagements. Parliament, therefore, interfered, and fixed rates at which all notes must be convertible, at a gradually reduced premium, until May 1st, 1823. After that date all notes were to be convertible into gold at their full value. The Bank did not, however, avail itself of the full delay allowed by Parliament: and from May, 1821, there were practically no more inconvertible notes in circulation. This gradual restriction of the currency naturally lowered prices, and the fall was further hastened by the outbreak of revolutions in Spanish America (p. 6), and the consequent interruption of silver mining. The further fall in prices which ensued checked the development of industry, lowered profits and wages, and increased the numbers of the unemployed.

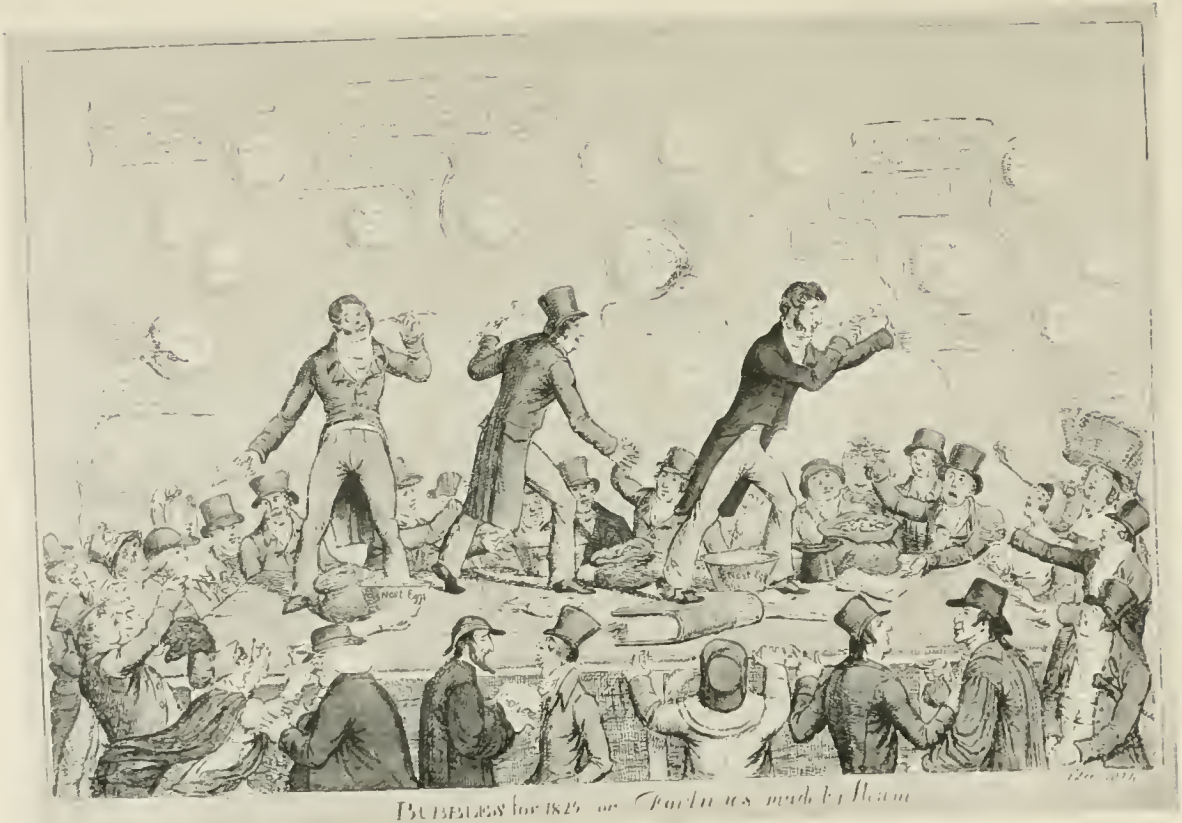
Better Times, 1822-1824.

Nevertheless, the return to cash payments tended, in the long run, to restore confidence and credit. Accordingly, from about 1822, there began to be distinct evidences of an improvement in trade. The financial policy of the Liverpool Cabinet was at this time largely directed by Mr. Huskisson, who took advantage of the growing prosperity to introduce a number of changes in the direction of Free Trade. In June, 1823, the Navigation Laws were practically repealed, in the case of all foreign nations that were willing similarly to remove restrictions on trade done by British vessels. Our shipowners said they would certainly be ruined, but in twenty years the English merchant navy was increased in tonnage by over forty per cent. Huskisson next

proceeded to relieve the important wool and silk industries from a large part of the protective duties by which they were hampered. The tax on imported raw silk was almost abolished, that on spun silk was about halved, and even that on manufactured silk was reduced. British silk manufacturers believed that they could not hold their own against the French without more protection, but the event proved that they were soon able to sell silk goods in the French markets. The woollen trade was similarly relieved. Hitherto our manufactures were hampered by import duties, and our agriculturists by export duties on raw wool. Both trades were now set free, and both gained much by the change.

Crash of 1825.

It is possible that Huskisson was moving even too fast. The stimulus given to trade by his bold policy was supplemented by the opening of South American and Mexican markets. The rebellious Spanish Colonies had attained their independence, and mining operations were renewed. A period of over-speculation ensued. A number of joint stock companies were formed, many of them by dishonest persons anxious to reap the fruits of the exaggerated hopes of a speedy fortune to be made in commercial undertakings. The Bank of England, as well as the private banks, were too much inclined to avail themselves of the alacrity of the public to take their paper. Sharing in the general confidence, they showed an undue readiness to give credit. There followed that sort of crash with which later experience has familiarised us. Bubble companies burst, credit contracted, everyone began to call in his money, or to refuse to part with it. Rash speculators, as well as those who had been only unfortunate, or somewhat too sanguine, were ruined: and many legitimate companies and honourable individuals were dragged down by the reaction from excessive confidence to equally excessive caution. In six weeks more than sixty banks stopped payment. The Government did its best to check the panic. The Mint worked hard to replace the metallic currency, which had been driven out of circulation by the excessive issue of bank-notes. The restriction under which private banks had been limited to six partners, thereby limiting the solvency of the banks, was abolished. The directors were persuaded to lend freely where the security was good, and the issue of one pound and two pound notes was forbidden from the idea that small notes are especially likely to be over-issued.




FORTUNES MADE BY STEAM, 1825.

*(From a contemporary satirical print.)*

Depression, 1826-1832.

All these measures, with the doubtful exception of the last, were wise and timely, but they could not prevent great and widespread suffering. The contraction of credit compelled a contraction of business, which threw thousands of the working classes out of employment. Once more there was an outbreak of rioting and machine breaking. The distress was so severe that Huskisson actually succeeded in persuading his Tory colleagues to modify the Corn Laws. Already, in 1822, a slight change had been introduced in the form of a sliding scale. The scale was now altered. When the price of wheat was as low as fifty shillings a quarter the duty on it was to be thirty-six and eightpence, but as the price rose the duty was to fall. When the price reached sixty-eight shillings the duty was to be sixteen shillings and eightpence. When it reached seventy-three shillings the duty was to be only one shilling.

Gradually trade began to recover, and indeed there were forces at work tending to enrich the nation, which could hardly fail to balance in the long run evils due to mere credit fluctuations. Foremost among these was the introduction of railways (p. 273 *seq.*), by which an immense demand for labour and capital was created, and industry thus helped to recover from the panic of 1825, and the subsequent depression.

Railways.

Trade Unions.

Meanwhile the law against trade combinations had been first repealed, and then very partially restored. The movement for the repeal was directed with great skill by Francis Place, a man who began life as a journeyman breeches-maker.[1] In 1818 he started a newspaper, in which he pleaded for the right of combination with so much ability as to enlist the advocacy of Joseph Hume and J. R. McCulloch, then editor of the *Scotsman*. Chiefly through Hume's advocacy, a committee of inquiry was appointed by the House of Commons in 1824. Place organised the evidence so effectually that a Bill was passed repealing all laws against combination. The result was a series of strikes, which so alarmed the ruling classes that Parliament again declared combination to be illegal, but an exception was made in favour of associations for dealing with questions of wages and the hours of labour. This was in effect a great victory for the workmen. It must be attributed partly to the spread of the doctrines taught by Adam Smith, which

[1 His life has been written by Graham Wallas (1898).]

implied a certain freedom of combination. Huskisson, Peel, and others of the younger Tories had accepted this part of the orthodox political economy, and held firm to it against tremendous pressure from the employing class. A formidable agitation and fears of a revolution no doubt helped the Ministry, and the fact that Parliament was essentially a body of landowners, and that the capitalist employers were comparatively weak in it, was, of course, very conducive to a fair hearing of the case of the unemployed. The victory, however, was only partial, for the somewhat ambiguous prohibitions of molestation and of obstruction were certain to be rigidly enforced against trade unionists. The years immediately following the Bill were years of trade depression (1826–30). Unions multiplied, but were generally defeated in their attempts to prevent reductions in wages; and the more thoughtful of the working men began to rest their hopes rather on radical and socialistic reforms than on the efficacy of strikes and trade organisations. The new unionism of 1829 to 1842 was based on the belief that there ought to be a national confederation of workers, and not merely separate unions for the different trades. In December, 1829, "The Grand General Union of the United Kingdom" was formed. It was to be open to all male workers at a subscription of a penny a week. This union soon fell to pieces, but a few months later a fresh society was formed by delegates from twenty organised trades. It was called "The

FRANCIS PLACE, BY DANIEL MACLISE, R.A.
("*Fraser's Magazine*," 1836.)

National Association for the Protection of Labour," and its aim was to prevent reductions, but not directly to promote advances of wages. Unionists had yet to learn that strikes against reductions are less likely to be successful than strikes for advances. They naturally disliked the former more than they liked the latter, but, as reductions usually come with a contraction in trade, a policy of mere general resistance to reductions is not likely to be successful. However, the National Association was for a time fairly flourishing. It obtained large funds, and in 1831 it started a paper of its own—*The Voice of the People*.

**The Reform Movement.**

The efforts of the trade unionists to organise combinations either of separate trades, or of a more general character, were, however, less in evidence than the agitation for an extension of the suffrage and a redistribution of seats. Throughout this period there were two distinct movements, one aiming at an improvement in the condition of the poor by legislative changes, the other attaching most importance to voluntary combinations and organisations. As early as 1819 a great reform meeting at Manchester was dispersed by force (the Peterloo Massacre, p. 3). The subject was then taken up by the Whigs in Parliament, and the outside agitation was to some extent quieted; but after 1823, when the Parliamentary movement languished, the country began to show unmistakable signs of a genuine demand for manhood suffrage, equal electoral divisions, annual parliaments, and the ballot. Meanwhile the middle classes were becoming more and more determined on changes far less sweeping than these, but almost equally hateful to the aristocracy. The death of George IV. gave them their opportunity, and the Radicals showed more readiness than might have been expected to support the more moderate reformers. By means of enthusiastic meetings, and ultimately by riots, they supplied the democratic

DOUBLE SOVEREIGN OF GEORGE IV.

THE MASSACRE OF PETERLOO, OR BRITONS STRIKE HOME, BY GEORGE CRUIKSHANK.

pressure that helped to ensure victory to the great middle class.

General Results, 1815-1832.

On the whole, then, this period was a period of distinct, though slow, progress. The population of the United Kingdom rose from about eighteen to about twenty-four millions. National wealth increased even more rapidly. In money value the increase is estimated at fifty per cent.; but if the fall in prices be allowed for, we cannot put the actual increase of wealth, measured in commodities, at less than eighty per cent. The burden of taxation was also much diminished, and the annual national expenditure had fallen from one hundred to fifty-two million pounds. There was, however, little increase in wages. The improvement was mainly among the well-to-do. The evils of the factory system (p. 298 *seq.*) were at their worst. Labour was still almost unorganised. There was no system of national education, and the overworked children were almost without instruction. On the other hand, the working classes had gained much knowledge and experience, especially through their failures, and were soon to secure for themselves improved conditions of labour.

LION SHILLING OF GEORGE IV.

"JOEY" GROAT OF WILLIAM IV.

MARY BATESON. Social Life.

As the lives of Queen Charlotte and of George III. drew to a close, men began to fear lest a crop of social evils should spring from the example set by the Prince-Regent and his wife. Sir Walter Scott writes in 1818: "If we should suppose the Princess of Wales to have been at the head of the matronage of the land for these last ten years, what would have been the difference on public opinion! . . . . . Honest old Evelyn's account of Charles II.'s court presses on one's recollection." But if George IV. with his eighteen mistresses—five historic,

eleven named, two unnamed—could compete with Charles II. in wantonness, in social talent he could not do so; nor, even had his gifts been greater, could he have rivalled Charles II.'s influence, for social conditions were changed. The personal influence of the sovereign was never stronger than in the reign of Charles II., never weaker than in the reigns of George IV. and his brother.

QUEEN CAROLINE'S MATRIMONIAL LADDER.

(*By George Cruikshank.*)

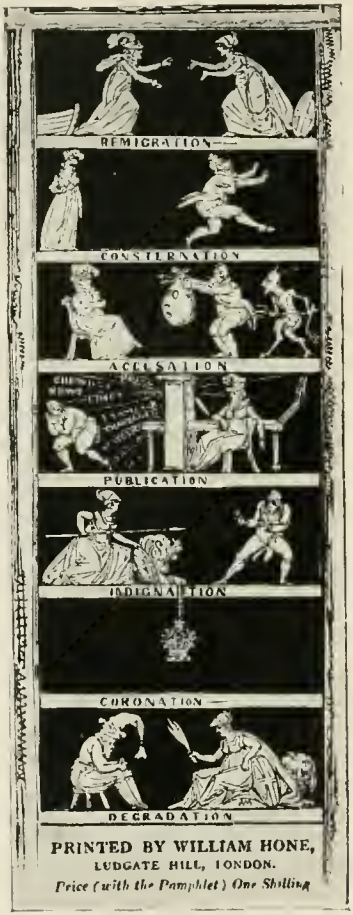
The Prince Regent did not exercise any paramount authority even on the subject of dress, for there his friend Beau Brummel was supreme dictator as president of the Council of Taste, and the Regent himself wept when the Beau disapproved of the cut of his coat. When the Beau's influence was removed, George IV. showed himself unwilling to succumb to a new fashion till it had been firmly established in his despite. In 1816 Weston, in Old Bond Street, had the best cut for the long-tailed and short-waisted coat, which for morning and evening dress alike was generally blue. Pantaloons were close-fitting and made of stockinette; they stopped some inches short of the ankle, showing black silk stockings and pumps. About 1830 pantaloons were superseded by long black trousers, held in place by silk straps under the foot. Only at court, at the opera, and at Almack's balls, knee-breeches and "chapeau bras" were still etiquette.

**Men's Dress.**

1832]

When Lord Barrymore, a leader of fashion put his hat on a chair, George remarked, "A well-bred man places his hat under his arm on entering a room, and on his head when out of doors." In 1824 the tails of the coat were shorter, and the frock coat made its appearance. Brass buttons went out, but the button-holes were now heavily frogged, while a black stock was worn instead of a white stock or cravat with a cauliflower frill.

Till the middle of the period women's walking and evening dresses were still made of light materials in all seasons, and when cloth dresses began to be worn indoors, grave dangers to health were anticipated. Instead of the long, plain, clinging skirts, petticoats were made short, wide, and over-trimmed. The characteristic garment of the period was the pelisse. In 1819 the mourning for Queen Charlotte was black crape over a white satin slip, black cloth pelisse lined with white sarcenet and trimmed with white silk cord, a bonnet of black Leghorn trimmed with blond and satin. By 1820 the waist was in its natural position, and the bodice and sleeve, which in the classical period almost vanished, began to grow wider and wider; indeed the "gigot" sleeves in 1827 were as big as those of 1894, and the width from shoulder to shoulder was increased by the pelerine. In 1815 the small beehive bonnet was worn, but in 1827 bonnets were as big as umbrellas. At that time it




QUEEN CAROLINE'S MATRIMONIAL LADDER.

(*By George Cruikshank.*)

Women's Dress.

was fashionable for ladies to carry real flowers. The style of hair-dressing was not becoming to many faces, for the hair was drawn up tightly and dressed high; curls or "pouffs" were arranged *à la Chinoise* on each side of the parting, or on the left side only, while ribbon loops were woven in among them, and plumes of marabout flowers, or combs stood above erect: in 1830 the high tortoiseshell comb *à la giraffe* was in vogue. The abolition of the crinoline from Court, where it had held its own throughout the classical period of fashionable dress, was due to George IV.'s decree.

EVENING DRESS, 1825.
("*Repository of Arts*," *Vol. VI.*)

George IV. can also claim to have conferred a benefit upon his country when he naturalised the *suprême de volaille*, and other inventions of French cookery. His influence upon the table of the upper classes was not

**Food.**

due only to example, for he put his most famous cooks to national uses. A number of club men were dining with him when he was Regent, and he asked them about their dinners. They one and all complained of the eternal joints, beef-steaks, boiled fowls with oyster sauce, and apple tarts; wherefore, taking compassion upon them, George prevailed upon his cook Wattier to start a club. This ultimately failed by reason of the high play at macao, but another of his cooks, Ude, undertook the cuisine of Crockford's Club, made it famous, and was succeeded by Francatelli. Gronow describes his dinners as "wonderfully solid, hot, and

MORNING DRESS, 1819.
("*Repository of Arts*," *Vol. VIII.*)

PROMENADE DRESS, GIGOT SLEEVES, 1827.
(*"Repository of Arts," Vol. X.*)

WALKING DRESS, PELISSE, 1822.
(*"Repository of Arts," Vol. XIII.*)

WALKING DRESS, 1819.
(*"Repository of Arts," Vol. VIII.*)

stimulating." Mulligatawny and turtle soups were served, with salmon at one end of the table and turbot with smelts round it at the other; then saddle of mutton or roast beef, and fowls, tongue and ham "succeeded as regularly as darkness after day." Four side-dishes, flanks, and removes were required, and the entrées would be placed in duplicates at opposite corners. But the French side-dishes were there, Gronow says, for appearance sake only, and went away neglected because they were not well cooked. The wines were sherry, champagne, and port, and after soup everyone began taking wine with everybody else till the end of dinner. Dr. Kitchener, the author of the popular "Cook's Oracle," recommends the host to fill the plates and send them round, and not to ask each guest if he will take soup or fish, or what particular part he prefers, since all cannot be choosers.

**Clubs.**

Clubs of the new model are said to have been invented by the officers retired on half-pay after the peace, who regretted the loss of mess dinners, and to supply their place opened the United Service Club in 1819. In the new clubs all the members were co-proprietors, not mere subscribers. The old clubs, which had originally been coffee-houses, were called subscription clubs for distinction's sake; they were run each by a single proprietor, who made his profits out of the subscriptions and the hazard table. At the new clubs, with an average entrance fee of twenty guineas, and subscription of ten guineas a year, it was possible to provide the members with the comforts of a magnificent hotel, eating-house, café, reading-room and library. H. Crabb Robinson's opinion of the newly created Athenæum, 1823, was that "it is a genteel establishment, but I foresee it will not answer my purpose as a dining-place."

**Tone of Society.**

The new clubs were more utilitarian and less exclusive than of old, when surgeons, architects, and attorneys could find no admission. But exclusiveness was still the golden rule of society in London. The test of membership of the fashionable world was a ticket of admission to Almack's. The lady patronesses who held the keys of this seventh heaven were known to be inflexible. Admission to the opera also was by ticket, requiring the voucher of a lady patroness.

In 1842 Raikes writes that the change in society is very apparent—

1832]

"It was called, and perhaps justly in my time, dissipated; but the leaders were men of sense and talent, with polished manners, and generally high-minded feelings. The young men of the present day seem without any prominent feature of character, indifferent instead of fastidious, careless in their manner to the women, and making it the right thing to *afficher* a heartless, selfish tone of feeling, such as would not be tolerated in French society, where the women certainly maintain a social influence that is not to be observed here."

He finds no respect for social conventions in London drawing-rooms, in dress, manner, or language. "Steam has here dissolved the exclusive system and seems to have substituted the love of wealth for both the love of amusement and of social distinction." Raikes's view is perhaps unduly gloomy. Had he been writing in 1820 he would probably have found as little to praise. Like Gronow, he would have told us that the dandies were "not high-born, nor rich, nor very good-looking, nor clever, nor agreeable, but generally middle-aged men, with large appetites, who sat in White's bay-window, swore a good deal, never laughed, had their own particular slang, looked hazy after dinner, and had most of them been patronised by the Prince Regent or Beau Brummel." But the Prince Regent did not produce them, nor did steam abolish them; they are with us still.

The women, Gronow says, were more beautiful, better bred, and more distinguished in appearance, and above all in manner, than they are nowadays (1860). "How grand they used to look with their tall, stately forms, small thoroughbred heads, and long flowing ringlets." There were none of the fast girls, such as Gronow saw in 1862; he grieved to find that the ideal was something between the dashing London horse-breaker and some Parisian dramatic artist, and that a jaunty, devil-may-care look was accounted the thing. It was probably the crinoline that made women appear short to Gronow's eyes, and it is hard to believe that in that demure and matronly attire the girls of 1862 were addicted to betting and slang.

**Literary Lions.**

Literary distinction in either sex met with ample social reward. George IV., with his usual affection for the example of Charles II., cultivated the society of wits, and admitted even the journalist Theodore Hook to his table, because of his fame as a jester. In fact, it needed the wits to make the long sittings over the dinner-table bearable. More purposeless was the rage for literary and scientific lions. Harriet Martineau gives an

amusing account of lionism in 1830, of the measures a hostess must take to draw out a literary lady, of the girls begging each for just one line in her album. At her own soirées Miss Martineau would have no crowd of admirers round a gentleman haranguing on the sofa which he keeps all to himself, and "no literary flirtations in the style of half a century ago." She mocks at Lady Mary Shepherd for saying, "Come now, let us have a little discussion about space." The most successful "salons" were those of Lady Blessington, of the Dowager Countess of Cork, and of Lady Holland. Lady Blessington at Seamore Place, and afterwards at Gore House, Kensington, gathered about her a host of authors, booksellers, publishers, and journalists whom she got to contribute to her Book of Beauty, the Keepsake, Flowers of Loveliness, and other literary efforts of her editing, but her parties were not for men's wives.[1] Lady Holland's "omnium-gatherums" were more cosmopolitan and more political in tone. Between 1799 and 1840 there was scarce an Englishman of any distinction in politics, science, or literature who had not been a guest at Holland House. Oddly enough, in 1831 the meal for the poets was declared to be breakfast, for Rogers and Moore shone at this prosaic hour; Macaulay could be relied on at all hours. Even at breakfasts Moore could be coaxed to sing his Irish melodies, unaccompanied, for it was a time when unaccompanied singing was a fashionable accomplishment, as harps were too cumbrous to carry, and not every house had a piano. At this time, too, literary and scientific interests were the rage, and society crowded to the meetings of the British Association, and passed the hours away in lecture-rooms, hearing Carlyle at Willis's Rooms, or Faraday at the Royal Institution.

**Dances.** The fashionable dances of the period were the waltz, introduced in 1813 by Madame de Lieven; the quadrille, brought from Paris by Lady Jersey after the Peace: Lancers, a variation of the quadrille, introduced about 1820; the "sprightly galoppade," and after 1830 the polka.

**London.** Between 1831 and 1881 the population of London increased from an average of 22 to an average of 51 per acre. The districts in which the growth has been most remarkable are:—

[1 *Cf.* J. F. Molloy, *The Most Gorgeous Lady Blessington*, 1896. For Lady Holland, *cf.* Trevelyan, *Life of Macaulay*, I., and the *Greville Memoirs*.]

| District. | Population per acre 1831. | Population per acre 1881. |
|---|---|---|
| Bromley-by-Bow ... ... | 9 | ... 106 |
| Paddington ... ... ... | 12 | ... 86 |
| Kensington ... ... ... | 9 | ... ... 74 |
| Fulham ... ... | 4 | ... ... 56 |
| Camberwell ... ... | 6 | ... ... 42 |
| Hampstead ... ... ... | 3 | ... ... 20 |

Bow, Stratford, Bromley, Clapham, Tottenham, Canonbury were still villages in 1831, while Brixton, Kilburn, Chalk Farm, Kentish Town formed no part of continuous London. Islington had but

LITERARY LADIES, BY DANIEL MACLISE, R.A.
("*Fraser's Magazine*," 1836.)

one street; Westbourne Grove, Notting Hill, Campden Hill, Earl's Court, were country districts. The Bayswater Road and Tyburnia had lately become fashionable building sites now that criminals were no longer hanged at Cumberland Gate. In 1820 Moorfields and Spafields still had some green acres; Woburn, Tavistock, and Gordon Squares were laid out in market gardens. Among the improvements of the reign was Regent Street with the Quadrant and Waterloo Place, planned by Nash to connect Carlton House and Pall Mall with the new house which the Regent proposed to build for himself overlooking Regent's Park. The Whigs, who were horrified at all George's extravagant

building schemes, vowed that they would never desert Bond Street to walk under the covered arcade of the Quadrant, which was supported by 140 cast-iron pillars, the object of much indignation.[1] It was the age of stucco building, and George IV. fell in with the prevailing taste. "He finds London brick and he leaves it all plaster." But the democratic party ought to have been pleased at the changes in Hyde Park, where the brick wall, which shut it in all the way to Kensington, was removed,

REGENT STREET, WITH THE QUADRANT COLONNADE
(*Shepherd and Elwes, "Metropolitan Improvements in London in the Nineteenth Century,"* 1829.)

and iron railings were substituted. Following the example of Charles II., George IV. interested himself in the parks: in 1827–29 St. James's Park was relaid, and his own Regent's Park was the wonder and delight of his time. The Zoological Gardens were opened in 1828, and among the chief national undertakings were the National Gallery, 1824, and the adaptation of Montagu House to the needs of the British Museum, which acquired George III.'s library in 1821. At the Covent Garden pantomime a possible Thames Embankment was shown as a panorama, "a pleasing anticipation of a splendid dream, which not even in this projecting age can become a reality." It had been talked of in 1666 by Sir Christopher Wren, but it was not made till 1870. The new London Bridge, planned by

[1] The arcade was removed in 1848.

WEST LONDON IN 1832.

*(From a contemporary map.)*

Rennie in 1823, was opened in 1831; Waterloo Bridge in 1817. Improved markets were laid out: Covent Garden fruit and flower market was built 1829–30; Fleet Market was moved in 1829, and the old Fleet Market became Farringdon Street; Hungerford Market, now the site of Charing Cross Station, was rebuilt in 1830. In 1833 £100,000 was spent by a private speculator on Islington Market, but the Smithfield live-stock market remained in a bad state till it was removed in 1855 to Copenhagen Fields.[1]

**Public Carriages.**

Many rich merchants still lived at their places of business in the City, but many were already building houses far distant from business, and a system of stage carriages was in use for those who lived in the suburbs. By 1837 there were licensed 400 omnibuses, 1,200 cabriolets, and 600 hackneys, instead of the 1,300 hackneys which in 1815 were the only public conveyances. The omnibus was noticed by Crabb Robinson in Paris, August, 1828; he foretold that by Christmas it would be in use in London, and his prophecy was fulfilled. Shillibeer's 'buses were drawn by three horses, and carried twenty passengers inside and nine out. For every 'bus ride, long or short, the charge was 6d. The cabriolet was peculiar to London, and was invented by Davies in 1823. Eight were licensed then, and plied at fares one-third lower than those of hackney coaches. The cabriolet or cab was for one passenger, who was protected by a high hood, which separated him from the driver sitting by his side. Hansom's patent cab (1834) had a square body in a square frame, with wheels as high as the vehicle. In 1836 Gillett and Chapman, improving on this model, produced the modern hansom. Street tramways, though tried experimentally in the Bayswater Road and other London streets by an eccentric American genius, G. F. Train, for a short period in 1861, and at Birkenhead and elsewhere, were not used on a large scale in London till 1870, when the Tramways Act was passed.

**Private Carriages.**

The fashionable family carriages in the period 1820–40 were yellow landaus, displaced in 1839 by the homely brougham, which allowed four to ride inside behind one horse. The dandy rode in a tilbury or curricle, which required two servants. There were also high four-horse phaetons, landaulets, Dennets or Stanhope gigs, Clarences, Vis-à-vis. The middle and lower

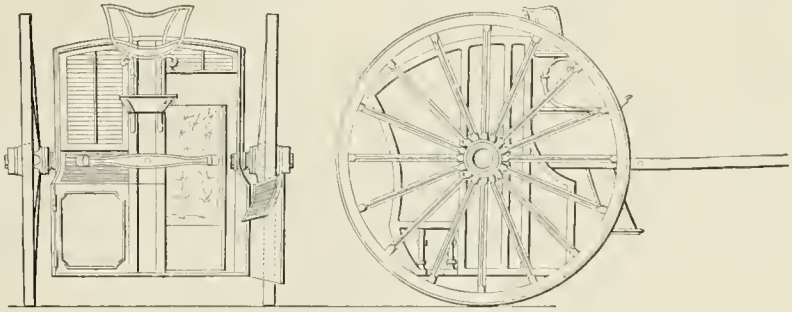
[1] *Cf.* Dickens's account of it in "Oliver Twist."

1832]

classes did not penetrate into Hyde Park at the fashionable hours, and then, as now, no hired cabs were there to detract from the brilliance of the scene.

The control of the traffic, which had belonged to the "street-keeper" in most parts of London, passed in 1829 to a new police force. There had been in 1818, 1822, and 1828 inquiries into the condition of the London police, which showed the organisation to be inadequate, antiquated, and indeed almost medieval in character. There was first the general police for the

Police.



SPECIFICATION DRAWINGS FOR HANSOM'S CAB, 1834.

City, under the control of the Lord Mayor and aldermen, which consisted of a number of officers engaged in day or night patrol, whose duty it was to visit the watch-houses and supervise the officers appointed by the wards. Each ward appointed a certain number of beadles, constables, watchmen, and street-keepers, paid by a rate levied on the ward. The beadles were annually elected; the constables, who were chosen in rotation from the inhabitants of the ward, and were bound to attend the whole night at the watch-house, received no salary, but could hire substitutes from £8 15s. a year. Only in some wards was there an afternoon patrol, from about three or four p.m. till the night watch was set. The watchmen were appointed by the Alderman and Common Council of the ward, and since the Act of 1817 care was taken to employ none but able-bodied men. Almost every ward had a street-keeper to regulate the traffic, who attended from eight a.m. till the patrol came on duty. Besides this central and local force in the City, there was the entirely separate police of the Dean and High Steward of

Westminster, and local forces in each parish of Westminster. Further, there was the separate establishment of magistrates and clerks and police officers at Bow Street with a foot and horse patrol under their authority, who were established in 1805 to prevent highway robberies within twenty miles of

MASTER DOGBERRY, THE PARISH WATCHMAN
*(From a satirical print of* 1829.)

London: and also a separate organisation for the Thames police, and for six other police-courts.

The Act of 1829 declared that the limited sphere of authority and the want of connection and co-operation rendered the force inadequate, wherefore a new force under the direct control of the Home Secretary was created, and London was mapped out into police districts, all obedient to two officials, who were at first called Justices of the Peace, and in 1839

1832]

became Commissioners. In 1856 the two Commissioners were replaced by one Commissioner and two Assistant-Commissioners. The City of London was not to be one of the Metropolitan police districts, but in 1839 it was secured that the police of the City should be of the new type under the control of the civic corporation. The original change was not brought about without a severe struggle with vested rights, and the scheme was believed to be part of a great plot to establish a military despotism. Cobbett raved against a police establishment *à la* Bourbon, with commissaries at the head and with subaltern officers, with men in an uniform dress, and with others *dressed like other people*, going about into all companies and places, and communicating what they saw and heard to the commissaries. By this system he believed that Sir Robert Peel had laid the foundation of an Austrian slavery or of a dreadful convulsion. Ultimately, however, the principle of centralisation was applied to the whole country; first by the permissive Act of 1839, which allowed justices at Quarter Sessions to create a paid constabulary, and next when, in 1856, this permission became compulsion.

JAMES COLVILLE. Scotland.

The fever heat which had carried the nation to the triumphant close of the great war was followed by a reaction in which every industry was depressed, every interest disaffected. In 1812 the weavers of the west formed their first formidable combination against low wages and dear meal. They found it hard to exist on a weekly pittance of 8s. 6d. with meal at 3s. a peck. But the Riot Act and the shooting down of luckless victims on the streets of Glasgow crushed disaffection. Probably there were never so many destitute at one time in Edinburgh as in 1816—a sad year for the poor, for the harvest had been unusually bad, foreign markets were glutted, and wheat was doubled in price. During the winter of 1819–20 the Clyde was frozen over for months, and employment scarcely to be had. The starving weavers flocked to Edinburgh, where relief works had been started. The heads of the well-to-do classes were stuffed with rumours of the secret drilling and arming of a vast Radical horde, and everywhere yeomanry and sharpshooters were volunteering against mob law. The excitement culminated

in the Bonnymuir rising of April, 1820, a sort of Scottish Peterloo.

**Radical Rising.**

It seems to have been a diabolical plot of the party in power to entrap the disaffected into overt action. On the first Sunday of April all Glasgow was thrown into panic over a treasonable placard, calling upon the oppressed to "assert their rights at the hazard of their lives." A Government spy induced about a hundred desperate weavers to march towards Carron, and after a weary trudge the famished band were set upon by cavalry from Stirling and taken prisoners. Three of these deluded visionaries were tried and executed as leaders—Hardie, Baird, and Wilson. Carlyle, visiting Edward Irving in Glasgow immediately after the affair, says, "The Radicals are quiet. How many lies have been told about them! Poor wretches, they are to be pitied as well as condemned." As a student in Edinburgh, he had just "seen substantial burghers and other idle loyalists training themselves to the use of arms for suppressing imaginary revolts of the lower orders. Steel pills, though a very natural, are a very inefficient remedy for a decayed constitution."

**George IV. visits Edinburgh.**

To the great delight of the Tories, George IV. visited Edinburgh in August, 1822. Scott's adaptation of an old song, "Carle, now the king's come!" was on every lip. He landed at Leith and held court at Holyrood amid a burst of romantic enthusiasm unknown since Prince Charlie's entry into his northern capital. It was calculated that one-seventh of the entire population feasted their eyes on their anointed king, whose sartorial sentiments must have been gratified by the magistrates' command to the citizens to dress for the occasion in nankeen pants, white vest, St. Andrew cross in hat as a cockade, and blue coat with "Welcome" on its large gilt buttons. Christison saw it all as a lad, and very sensibly remarks—"Sir Walter Scott as M.C. and costumier was responsible for spreading the common delusion of Englishmen and foreigners that Scotland is *a nation of Celtic Highlanders*," an absurd delusion still growing in vogue daily.

**The Reform Act.**

No part of the kingdom took a more earnest or intelligent share than Scotland in the constitutional victory of 1832. With the opening century reforming principles had spread, mainly from the University and the Bar, and this through the influence of such men as Brougham, Jeffrey, Cockburn, Horner,

1832]

Sir William Petty, and Lord John Russell—all legitimate products of a Scottish education in political reasoning. This was all the more surprising as Edinburgh University was under the control of the Town Council, Tories to the backbone, while the Court of Session had always been an appanage of the landed interest. A notable incident of 1817 was the appearance of

FRANCIS HORNER, BY SIR HENRY RAEBURN, R.A.
(*National Portrait Gallery.*)

an independent weekly, the *Scotsman*. Carlyle notes at the time that he had seen the first three numbers—"*all a little violent in their Whiggism.*" Bitter partisan hostility was a feature of social life then. The scandalous licence of the Tory journals led to a fatal duel, the great sensation of the day, when Stewart of Dunearn mortally wounded Boswell, son of Johnson's biographer. Another sign of the times was the frequency of great political meetings to petition on public questions, culminating in a notable gathering in 1830 to congratulate the French on their successful revolution.

The fate of the Reform Bill was followed with breathless

interest. Charles, now Earl, Grey, had warmly supported Thomas Muir in 1793–94, while Lord John Russell had sat at the feet of Dugald Stewart, the Edinburgh Professor. A general illumination in Glasgow marked the second reading of the Bill in the Commons. But the news of its rejection in the Lords was received by a crowd of about ten thousand indignant citizens, waiting patiently at the Edinburgh post-office, while similar sights were common in every considerable centre. When success was assured, a lovely August day of 1832 saw Bruntsfield Links and the Meadows covered with orderly processions and rejoicing spectators, all joining, with the earnest devotion of a Covenanters' Sacrament, in the sublime strains of "Scots Wha Hae!"

The Church.

The Church had long afforded the only open arena for advanced popular opinion. Moderatism and Dissent were now, thanks to fresh social problems, joined by a new power, Evangelicalism. These forces were respectively *conservative*, *exclusive*, and restlessly *aggressive*. Moderatism, very much the creation of Principal Robertson, the historian, had been, in its best days, an immense power for good in liberalising thought and action. This is what a keen but not very friendly critic like young Carlyle thought of its founder in 1824, when this once all-powerful movement was on the wane: "I used to find in him a shrewd system but not a great understanding, and no more heart than in my boot. He was a kind of Deist in the guise of a Calvinist priest, a portentous combination." A new spirit broke in upon his well-ordered system when Chalmers began (1815), in the densely peopled Tron parish of Glasgow, "to excavate the heathen," as he called the innovation. His week-day sermon, the Astronomical Discourses of his published works, was the first attempt to attract alike the religious and the literary public through the pulpit. His Sunday schools took up the movement which Dr. Burns, kindly minister of the neighbouring Barony parish, had inaugurated as early as 1775, five years before Raikes began work at Gloucester. The task upon which Chalmers and his eloquent assistant, Edward Irving, entered with such enthusiasm was the most notable social factor of the time. But an unkind fate has too often decreed that when some of Scotland's greatest appeared—Knox, Henderson, Chalmers—the bitter warfare of church polity, and not social amelior-

ation through Christian endeavour, has been the question of the hour.

Industrial Progress.

George Burns, of Cunard fame and a pioneer of ocean travel, rapidly developed the work which Henry Bell began, and, thanks to his energy and enterprise, before 1830 his deep-sea steamers were running from the Clyde as far as Liverpool and Dublin. They were engined by Robert Napier, a Glasgow blacksmith of great genius. In Aberdeen, Hall's clippers were carrying emigrants over the globe. From Glasgow and Dundee the weaving of cotton and linen was overflowing into the fields, and the click of the shuttle was heard in every hamlet. Savings banks, set agoing through the Rev. H. Duncan of Ruthwell in 1810, were helping the people to tide over the failures of 1826. The Union Canal (1822) connected Edinburgh and Glasgow; the Caledonian, the east and west sides of the island. Both cities were lit up by gas in 1818, an in the same year Edinburgh enjoyed her Crawley water, brought by gravitation from springs in the Pentland Hills. Magnificent new approaches adorned the city, 1823–27. Her School of Arts (1821) was spreading the technical education which the Andersonian People's College in Glasgow had begun, while to the activity of her medical teaching was due the Anatomy Act (1829), which followed the revelations of 1828 (p. 91).

THOMAS CHALMERS, BY KENNETH MACLEAY, R.S.A.
(*Scottish National Portrait Gallery.*)

P. W. JOYCE. Ireland.

For many years about this time there was great and widespread distress, arising partly from the stagnation of business after the conclusion of the Continental wars, and partly from the pitiless exactions of landlords, middlemen, and tithe-proctors. The misery culminated in 1822, when there was a general failure of the potato crop. There was much disturbance among the

starving and despairing peasantry, and there were numerous outrages, followed by the usual coercion acts with wholesale arrests and prosecutions, without the least effect in producing tranquillity; and the country was kept down only by an army almost as large as if it had just been conquered in a successful invasion.

**Catholic Emancipation.**

In 1823 the "Catholic Association" was founded by O'Connell and Richard Lalor Sheil, and soon spread through the whole country. The expenses were paid by what was called "Catholic Rent," a contribution of a penny a week from each member; and this organisation was the chief agency by which Emancipation was ultimately carried. In 1828 Mr. Vesey Fitzgerald, Member of Parliament for Clare, having accepted office, had to seek re-election, and O'Connell determined to oppose him. He knew well that he could not enter Parliament, for the admission oath was such as no Catholic could take; but he wished to bring before the electors of Great Britain the hardship and absurdity of disfranchising a constituency because the chosen member refused to swear that his own religion was false. Notwithstanding the crushing influence of the landlords he was returned by an immense majority. The Government were now greatly alarmed, and all the more so when they heard that the Catholic Association were preparing to return Catholic members all through Ireland. Wellington and Peel gave way, and introduced a Bill, which after a stormy debate was carried in the Commons. The opposition was still more violent in the Lords; but Wellington ended the matter by declaring that they should choose between Emancipation and Civil War; whereupon the Bill passed, and received the royal assent on April 13th, 1829. The Act contained one provision, raising the franchise in Ireland from 40s. to £10; though the qualification for England remained at 40s. (p. 12). By the Emancipation Act a new oath was framed which Catholics might take; and at the General Election of 1830, O'Connell and several other Catholics were returned.

**National Education.**

Hitherto the primary education aided by the State in Ireland was exclusively for Protestants; and Catholic children could not attend the public schools, as they would have to join classes receiving Protestant religious instruction. This state of things was remedied in 1831, when the system of National Education

A PARLIAMENTARY GAME OF SHUTTLECOCK.

*(From a satirical print of* 1829.)

was founded, which Catholics were able to take advantage of, inasmuch as it provided for separate religious instruction for children of different religious denominations. This measure turned out very successful; for since 1831 both the Government subsidies and the number of schools have gone on increasing year by year.

**Reform of 1832.**

After the great Reform Bill had passed for England in 1832, a corresponding Bill was introduced for Ireland in the same year. But though the Irish members led by O'Connell and Sheil had materially aided the Government in passing the English measure, the Irish Bill was narrow and unsatisfactory. The franchise was limited to tenants of £50 a year and leaseholders of £10 a year for 99 years. The Irish leaders attempted to have the franchise restored to the 40s. freeholders; but the ministers had the amendment voted down (p. 15).

**Tithe War.**

Of all the payments exacted from the peasantry tithes were the most bitterly resented; for their gross injustice was obvious to the most ignorant. The Protestant clergy lived comfortably all through the country, and ministered on Sundays in decent well-kept churches to congregations of perhaps half a dozen, or less; for all which the Catholic people were forced to pay—to support the clergy and keep the churches in repair: while their own priests lived in poverty, and celebrated Mass to overflowing congregations in thatched cabins or in the open air. And whenever tithe-payment was not at once forthcoming, the tithe-proctors seized and carried off the poor people's cows, fowls, bed-clothes, kettles, or anything they could lay hands on. At length, about the year 1830, a vehement movement arose almost simultaneously against tithes—quite a spontaneous uprising, not incited by leaders or agitators from outside; and for some years a destructive "tithe war" raged, especially in the south of Ireland. The military and police were called out to support the proctors, and there were frequent conflicts, with great loss of life. But even when a seizure was made, it commonly turned out useless: for no one dared bid for any seized article set up for sale; or if by chance a sale was effected, the purchasers were pretty sure to suffer outrage of some sort. The proctors were everywhere pursued with vengeance, often mutilated, and sometimes killed. Then came, of course, a Coercion Act; and the military engaged in this warfare formed

quite a large army; yet they succeeded in collecting only a small fraction of the total sum assessed, and even that at a cost far exceeding the amount collected. Hundreds of the Protestant clergy received little or nothing, and were reduced to destitution, seldom through any fault of their own, for they were the victims of an unjust and unwise institution: and the Government had to come to their relief by advancing a million on loan. At length, some years later (1838), the tithes were put on the landlords instead of the tenants, which terminated the tithe war.

THE FREEHOLDER BETWIXT PRIEST AND LANDLORD.
(*From a satirical print of* 1829.)

## AUTHORITIES.—1815–1832.

### GENERAL HISTORY.

Sir Spencer Walpole, *History of England from the Conclusion of the Great War in* 1815; Harriet Martineau, *History of the Peace;* May, *Constitutional History;* Justin McCarthy, *Modern England;* Fyffe, *Modern Europe;* Debidour, *Histoire Diplomatique de l'Europe;* Molesworth, *History of the Reform Bill;* Wheeler, *History of India;* Duke of Buckingham, *Memoirs of the Court of the Regency; Correspondence of William IV. and Earl Grey;* Le Strange, *Correspondence of Earl Grey and Mme. de Lieven;* Greville, *Memoirs; Croker Papers;* Pellew, *Life of Lord Sidmouth;* Twiss, *Life of Lord Eldon;* Alison, *Lives of Lord Londonderry and Sir C. Stewart;* Yonge, *Life of Lord Liverpool;* Stapylton, *George Canning and His Times* and *Canning's Speeches;* Peel, *Memoirs* and his *Correspondence*, edited by C. S. Parker; Herries, *Life of J. C. Herries;* Torrens, *Life of Lord Melbourne;* Sanders, *Melbourne Papers;* Sir D. Le Marchant, *Life of Lord Althorp; Brougham's Life and Times;* Spencer Walpole, *Life of Lord John Russell; The Creevey Papers*, 1903; Fitzpatrick, *O'Connell's Correspondence;* Metternich, *Memoirs;* E. Porritt, *The Unreformed House of Commons*, 1903, gives a full account of the conditions of Parliamentary representation in the three Kingdoms before the Reform Act.

### SPECIAL SUBJECTS.

*Naval History and Church History.*—*See* list appended to ch. xxiv.

*Literature*, 1815–1885.—Saintsbury, *Nineteenth Century Literature*, for the subject generally. In poetry the growth of Tennyson's genius is lucidly exhibited in Mr. Arthur Waugh's *Tennyson: A Study of his Life and Work*. For an acute and valuable, though not unprejudiced, criticism of Macaulay's prose style, chap. ii. of the late J. Cotter Morrison's *Macaulay* ("English Men of Letters" Series) may be consulted with advantage; and an appreciation of Carlyle's literary characteristics, and of his past and present relation to the thought of the age, will be found in the introduction to the Centenary Edition of his works.

*Geology*, 1815–1885.—Besides the more special works mentioned in the text, the following will be found useful:—J. Playfair, *Biographical Account of James Hutton;* J. Phillips, *Memoirs of William Smith;* A. Geikie, *Life of Sir Roderick J. Murchison*, 2 vols.; J. W. Clark and T. McK. Hughes, *Life and Letters of the Rev. Adam Sedgwick*, 2 vols.; *Life, Letters, and Journal of Sir C. Lyell*, edited by Mrs. Lyell, 2 vols.; T. G. Bonney, *Lyell and Modern Geology;* A. Geikie, *Life of Sir A. Ramsay*, and *Letters of J. B. Jukes;* F. Darwin, *Life and Letters of Charles Darwin*, 3 vols.; W. D. Conybeare and W. Phillips, *Outline of the Geology of England and Wales;* H. B. Woodward, *The Geology of England and Wales*. The details of the development of the subject will be found in the publications of the Geological Society; first in the *Transactions* (1811–56), and the *Proceedings* (1826–45), and then in the *Quarterly Journal* (vol. i., 1845). To these may be added *Memoirs* and other publications of the Geological Survey, and the annual volume of the Palæontological Society.

*Art, Chemistry, Textiles.*—*See* chaps. xxii., xxiii. and xxiv. respectively.

*Medicine.*—The General History of Medicine in the earlier part of the century may be read in Clarke's *Autobiographical Recollections of the Medical Profession* (1874, II.); in Dr. C. J. B. Williams' *Memorials of Life and Work*, 1884; and in Sir Robert Christison's *Life*, ed. by his sons (1885–86). The condition of the schools of anatomy before the passing of the Anatomy Act is well described in Lonsdale's *Life of Robert Knox*. The professional reader may refer with advantage to the Report of the Select Committee on Anatomy (folio, 1832), and to J. Blake Bailey, *Diary of a Resurrectionist* (1896). The evil effects of intramural interment can only be adequately appreciated by reading the disgusting details given in the Report of the Select Committee upon the effect of the interment of bodies in Towns (1842). Sir Thomas Longmore has prefixed a short history of the Army Medical Service to his *Manual of Ambulance Transport*, ed. 2,

by Surg.-Capt. W. A. Morris, A.M.S., 1893. Sir John Simon has published an admirable history of English Sanitary Institutions (Lond., 1890): whilst the history of Dentistry has been written by Alfred Hill (Lond., 1877), and the history of the Medical Education of Women by Miss Sophia Jex-Blake (12mo, 1880).

*Agriculture*, 1802–1846.—William Cobbett, *Tour in the Northern Counties*, *Rural Rides*; *Journal of the Royal Agricultural Society of England*, *1st Series*; Harriet Martineau, *History of the Thirty Years' Peace*; Sir George Nicholls, *History of the English Poor Law*, and *On the Condition of the Agricultural Labourer*; Sir Robert Peel, *Speech on the Repeal of the Corn Laws in the House of Commons*, 1846; G. R. Porter, *Progress of the Nation*, 1843; A. Prentice, *History of the Anti-Corn-Law League*; Reports of Select Committees on the Operation of the Poor Laws, 1817, 1834, 1844, and on Agriculture (*see* below); J. E. Thorold Rogers, *History of Agriculture and Prices*, and *Six Centuries of Work and Wages*; Russell M. Garnier, *History of the English Landed Gentry*, and *Annals of the British Peasantry*.

*Economic History*, 1802–1885.—The most important materials are to be found in Reports of various Parliamentary Committees and Commissions, especially on *Agriculture* in 1821, 1822, and 1833; on *Machinery* in 1824; on the *Poor Laws* in 1821, 1834, 1843, 1845, 1847, and 1849; on *Finance* and *Currency* in 1819, 1828, and 1841; on *Children in Factories*, 1816, 1833, 1842, and 1883; on the *Coal Trade* in 1830, 1844, and 1871; on *Framework Knitters* in 1845; on *Handloom Weavers* in 1839 and 1840; on *Joint Stock Companies* in 1844. To the list given in Vol. V., p. 513, we may add S. and B. Webb, *History of Trade Unions*; Holyoake, *History of Co-operation*; Frome Wilkinson, *Friendly Societies*; Goschen, *Foreign Exchanges*, and the works on Economics by Mill, Marshall, Walker, Cairns, Jevons, Bagehot, etc. There are many important papers in the *Journal* of the Statistical Society, but any adequate list of authorities would occupy more space than can be afforded here.

*Social Life* and *Scottish History*.—*See* ch. xxiii. For the society of this period, Ashton, *Social England under the Regency*, will be found useful. *Ireland*.—*See* ch. xxiv.

THE HOUSES OF PARLIAMENT IN 1821.
(*From an aquatint by R. Havell.*)

# CHAPTER XXII.

## THE NEW SPIRIT AND THE NEW PATHS. 1832–1846.

LLOYD C. SANDERS. Political History.

THE troubles of the Grey Ministry by no means ended with the reform of Parliament. The new House was eager for further changes, but the Government, confused by conflicting demands and divided against itself, introduced large and ill-considered Bills. Ireland, besides, blocked the way to English legislation. More formidable than O'Connell's Repeal agitation was the war against tithes (p. 148), supported by organised outrage. After a disastrous attempt to collect the unpopular tax itself the Government passed a Composition Bill, which by securing the advances to the Irish clergy on a land tax invited further resistance to the law. Lord Althorp's Irish Church Bill, again, was reduced to a disappointing fragment, which suppressed a few sees and docked the incomes of others. He dropped the Appropriation clause, permitting the use of surplus moneys for secular purposes. The terrific indictment of O'Connell by the Chief Secretary, Lord Stanley, secured the passage of a drastic Irish Coercion Bill, but he was shortly afterwards transferred to the Colonial Office to mollify the resentment of the Liberator.

Emancipation of the Slaves.

Stanley proceeded to carry a Bill abolishing slavery in the West Indies. A plan for gradual admission to freedom had been tried, but neither planters nor negroes accepted it loyally, and it was far from satisfying Sir Thomas Fowell Buxton and his fellow-enthusiasts. Stanley's Bill secured immediate freedom for all children of six years of age and under. The rest were to serve a twelve years' apprenticeship; but this expedient was abandoned after four years' disheartening experiment. The planters received the comfortable compensation of £20,000,000.

Finance in 1833.

Lord Althorp bungled his Budget, being defeated on a motion for the reduction of the malt tax by one-half. He was driven to threaten the House with a general property and income

tax, and Opposition votes turned the scale. The Government, however, renewed its contract with the Bank of England for twenty-one years, and made bank-notes legal tender, in spite of an irrational outcry against the possible depreciation of paper.

The session of 1834 found the Grey Ministry tottering. Lord Durham, after insulting his father-in-law, had resigned because it was not sufficiently Radical. There followed the retirement of Stanley and the more Conservative members, **A New Ministry.**

A PROTEST AGAINST EMANCIPATION.
(*From a satirical print of* 1833.)

who were frightened by a motion of Mr. Ward's on the Irish Church, embodying the principle of the Appropriation clause. Finally, the meddlesomeness of Lord Brougham and the blundering indiscretion of Mr. Littleton, the new Chief Secretary for Ireland, produced hopeless mismanagement over the renewal of the Irish Coercion Act. Lord Althorp persisted in resigning, and in July Lord Grey declared the administration at an end.

On Lord Melbourne, who judiciously declined to form a Coalition Cabinet with Peel and Stanley, fell the thankless task of patching together the old Cabinet, with the assistance of Althorp. Before the prorogation of Parliament the Bill for the reform of the Poor Law passed (p. 302). It dealt with a rate

exceeding £8,000,000 and a lax system of relief that was fast demoralising the agricultural labourer. The new Act grouped parishes together, and established central workhouses, governed by Poor Law Guardians. It permitted the continuance of out-door relief for the aged and deserving under severe restrictions. Finally, it abolished the Law of Settlement, which prohibited

IRELAND'S BIG BEGGARMAN.
(*From a satirical print of* 1833.)

removals from one district to another in search of work (Vols. IV., p. 654; V., p. 176).

Lord Brougham occupied the recess with a vainglorious campaign in Scotland, during which he succeeded in picking a quarrel with Lord Durham. The proceeding was scandalous, and it confirmed the king in his desire to be rid of the Ministry. He found his opportunity when Lord Althorp, on the death of his father, was removed to the Upper House. Melbourne was summoned to Brighton, and was told that the Duke of Wellington would be requested to form an Administration.

AN APPROACHING CONGRESS

*(From a satirical print of* 1833.)

Foreign Policy.

During these eventful years the strenuous diplomacy of Lord Palmerston had strengthened the credit of the country abroad. After tedious negotiations he succeeded in saving Belgium, which had risen in revolt against the House of Orange after the July revolution, from being overrun by the Dutch on the one hand, and from becoming a French province on the other. The candidature of the Duc de Nemours, a son of Louis Philippe, seemed likely to embroil England and France in war, but it was averted by Palmerston's firmness. He also exacted satisfaction from Dom Miguel, the Absolutist ruler in Portugal, who had seized British vessels: and his moral support of the cause of Donna Maria went far to secure its ultimate success. In Spain he promptly recognised Isabella as against Don Carlos, and in April, 1834, a Quadruple Treaty was signed by England, France, Spain and Portugal, binding them to compel the two pretenders to withdraw from the Peninsula. The British Legion, however, which was allowed to volunteer for Spanish service under an Order-in-Council, was disbanded after exploits the reverse of glorious. Nor was Palmerston able to prevent the Porte, alarmed by Mehemet Ali's rapid conquest of Syria, from surrendering itself to Russia, tied hand and foot by the Treaty of Hunkiar Skelessi (1833). He protested against it, as he protested against the abolition of constitutional liberties in Poland, but without avail.

The Tamworth Manifesto.

The news of Melbourne's dismissal reached Sir Robert Peel at Rome. Pending his arrival, the Duke had no fewer than four offices, but he at once surrendered the Premiership to Peel. A Ministry was formed including Wellington as Foreign Secretary, Aberdeen at the Colonial Office, and Goulburn at the Home Office. Peel recommended a dissolution, and issued the Tamworth Manifesto, which accepted the Reform Bill as "a final and irrevocable settlement," and advocated "a careful review of institutions, civil and ecclesiastical." The election failed to turn the balance of parties, and when Parliament met (February 19th, 1835) the Opposition carried Mr. Abercromby for the Speakership against Mr. Manners Sutton. Peel nevertheless fought that brilliant political campaign known as his "hundred days" before Lord John Russell defeated him on a motion embodying the principle of the Appropriation clause. "I certainly never remember," wrote Charles Greville, "a victory for which *Te Deum* was chanted with so faint and joyless a voice."

1846]

Lord Melbourne's second Ministry excluded Brougham, who had rendered himself impossible as a colleague. For the most part it was composed of old materials, Mr. Spring Rice becoming Chancellor of the Exchequer in place of Lord Althorp. It had no majority independent of O'Connell, and was, in consequence,

**The Second Melbourne Ministry.**

*Photo: Walker & Cockerell.*

SIR ROBERT PEEL, BY JOHN LINNELL.
(*National Portrait Gallery.*)

terribly weak. The Bill, however, for the reform of Municipal Corporations was carried before the close of the Session. It abolished much confusion and corruption, establishing in each corporate town a mayor, annually elected, and a town council for the management of borough funds. An amendment introduced in the House of Lords preserved their privileges to existing freemen. London was left untouched owing to the power of its vested interests.

Otherwise the record of the Ministry for the remainder of the

reign was one of failure. It carried a Bill legalising the marriage of Dissenters before the Registrar and in their own chapels, and a measure for the commutation of English tithe into a rent-charge based on the price of corn for seven years. But the Irish Tithe Bill was abandoned after the Appropriation clause had been rejected by the House of Lords, and a similar fate attended the Irish Municipal Corporations Bill. The English Church Rates Bill was introduced early in 1837, but it had not become law when, on June 20th, William IV. died. His hostility to the Whig party had latterly been most pronounced.

**The Reign of Victoria.**

The accession of a queen but eighteen years old, whose dignity and modesty delighted everybody, helped to strengthen the Ministry for the time being. Lord Melbourne set himself to form her mind, and discharged a delicate duty to universal admiration. The Government, after a general election, still lay at the mercy of Peel and Lord Lyndhurst on the one hand, and of O'Connell on the other. In the session of 1838 it passed the Irish Poor Law Bill, establishing a system analogous to that in England. The Irish Tithe Bill (p. 149) also became law after the Appropriation clause, on which the Whigs had staked their political reputation, had been rejected by the House of Lords, and the Government had tamely acquiesced in the rebuff. In 1840 the Irish Corporation Bill got clear of the House at last, after the Opposition had transformed it into what was practically a new measure. But though the Government displayed vacillation in Parliament, its Irish administration, thanks mainly to the Under-Secretary, Thomas Drummond, was most able and sympathetic.

**Penny Postage.**

Whig finance, as represented by Mr. Spring Rice, was deplorably bad. In 1839 he took up the reform of penny postage (p. 328)—a question brought to the front by the persistency of Rowland Hill—but it resulted at first in a loss to the revenue, and his Budgets gave a series of deficits.

**Chartism.**

Trade was slack and employment scarce. The working classes, among whom trade-unionism had been rapidly spreading, thought that sweeping legislative reforms were the only remedy. A People's Charter was framed (p. 307) containing six points:—(1) universal suffrage; (2) the ballot; (3) annual Parliaments; (4) the abolition of the property qualification for members of Parliament; (5) payment of members; (6) equal electoral dis-

tricts. Their nominal leader was an empty braggart, Feargus O'Connor, but behind him lurked a Physical Force party. After a National Petition had failed to secure the attention of Parliament, the extremists gained the upper hand. Riots occurred

THOMAS DRUMMOND.
*(The City Hall, Dublin. By permission of the Corporation.)*

at Birmingham and elsewhere, and there was a pitched battle with the military and police in the streets of Newport. The severe punishment administered to Frost and his fellow-agitators gave pause to Chartism for awhile.

The two provinces of Canada were drifting into rebellion at the beginning of the reign, chiefly from the mutual jealousies of

Canada.

the French and English populations. Upper Canada was saved by the resource of the Governor, Sir Francis Head, who threw himself on the loyalty of the militia. In the Lower Province, Sir John Colborne put down the rising with British troops. Thereupon, the Government resolved to send out Lord Durham, armed with special powers. He promptly issued an ordinance by which eight Canadians were transported to Bermuda, and Papineau and fourteen more, who had fled the country, sentenced to death. Brougham forced upon the Government the disallowal of the

*Photo: Siedle, Newport.*

CHARTIST ATTACK ON THE WESTGATE INN, NEWPORT, 1839.

(*From a contemporary print.*)

ordinance, and Durham, who had left it without a word of information, resigned and came home. However, he had signed a "Report on the Administration of Canada," drawn up by Charles Buller, which gave full constitutional liberties to the colonists, and the appointment of an able Governor in Lord Sydenham put an end to discontent. Shortly afterwards the beginnings of constitutionalism were established in Australia, when, in 1840, New South Wales was permitted to elect two-thirds of its Council.

The Bedchamber Question.

In May, 1839, the Whig Ministry was beaten on the Jamaica Bill, and resigned. Peel, who was summoned by the queen, clumsily insisted that the Ladies of the Bedchamber should simultaneously give up their appointments. The queen absolutely refused, and the Whigs returned to place though not to power. They lingered long enough to see the queen happily

RELICS OF THE CHARTIST RIOT AT NEWPORT.

(*By permission of the Committee of the Newport Museum and S. Dean, Esq., Westgate Hotel.*)

married (February 10th, 1840) to the husband of her choice, Prince Albert of Saxe-Coburg-Gotha, and to produce a Budget, Sir Francis Baring's, imposing a low fixed duty on corn, instead of the sliding scale. But that conversion was too sudden to be sincere. Defeated in Parliament on a vote of want of confidence, they were placed in a considerable minority at the

J. G. LAMBTON, FIRST LORD DURHAM, BY SIR THOMAS LAWRENCE, P.R.A.

*(By permission of the Right Hon. the Earl of Durham.)*

general election of 1841. The opportunity for which Peel had been patiently waiting had come to him at last.

**The Syrian Question.**

Lord Palmerston's diplomacy had been, as always, bold and effective. He did away with the Treaty of Hunkiar Skelessi, by concluding (July 15th, 1840) the Quadrilateral Treaty, whereby England, Russia, Austria, and Prussia bound themselves to protect the Porte against aggression. But France—where sympathy ran strongly with Mehemet Ali, who had overrun Syria—resented this arrangement, and prepared for war. Fortunately,

1846]

Louis Philippe had more prudence than his Ministers. He dismissed the Thiers Cabinet and appointed instead a colourless Ministry under Guizot and Marshal Soult. The hold of Mehemet Ali on Syria proved, besides, to be exceedingly feeble. Beyrout was bombarded by the allies in November. A month later Acre fell and the Pasha submitted.

The Afghan and Chinese Wars.

Fear of Russia had meantime driven the Government into interference in Afghanistan. Dost Mohammed, who had received a Russian embassy, was dethroned, and the puppet Shah Sujah installed in his place. The Afghans rose, and massacred the British force that had been stationed at Cabul after treacherously promising that it should be allowed to retire (p. 174). Sir Robert Sale, however, made an heroic defence at Jellalabad, General Nott held Candahar, and the disaster was ultimately avenged by General Pollock. On the other hand, a war with China was forced on England by the high-handed conduct of Commissioner Lin, who confiscated 20,000 chests of opium, and, in order to stop the traffic, forbade British vessels to approach Canton. After tedious operations, and still more tedious negotiations, peace was declared in 1842, whereby we acquired Hong-Kong, and five ports were opened to commerce.

Peel's Second Ministry.

Peel's second Cabinet contained tried Conservative politicians in the Duke of Wellington (who did not take office), Lyndhurst, the Lord Chancellor, Goulburn, the Chancellor of the Exchequer, and Lord Aberdeen, the Foreign Secretary. Of the Whig seceders Stanley became Colonial Secretary, Graham Home Secretary, and Lord Ripon, formerly Lord Goderich, President of the Board of Trade. The Ministry seemed likely to last a generation. But Peel's hand was forced by the agitation of the Anti-Corn Law League, which had eloquent spokesmen in Mr. Villiers within the House, and in Cobden and Bright outside it. He had been returned to uphold Protection; he was rapidly forced to abandon that principle. The financial measures of 1842 modified the sliding scale, imposed an income tax of 7d. in the pound, and reduced duties on 750 articles. The effect was to annoy the agriculturists without conciliating the Corn-Law Repealers. The Budget of the following year contained, nevertheless, a further reduction of duties, notably that on timber.

The Budget of 1842.

In the session of 1842 Lord Ashley carried a Bill forbidding the employment of women, and limiting that of children in

mines and collieries (p. 312). Next year, Sir James Graham was forced by him to introduce a Bill lessening the labour and providing for the instruction of children in factories. The education clauses created such a clamour that the Bill had to be dropped. It passed in the session of 1844, without the obnoxious clauses, the hours of labour being fixed *at ten*, much to Lord Ashley's indignation.

**Peel's Irish Policy.**

In Ireland Peel found himself confronted by a revival of the Repeal agitation (p. 338). O'Connell was still its mouthpiece, but in alliance with him were Thomas Davis, Charles Gavan Duffy, and other excitable youths, calling themselves "Young Ireland," and favouring rebellion in their noisy verse. A series of monster meetings tried the patience of the Executive, and in October, 1843, a gathering at Clontarf was proclaimed. The arrest of O'Connell followed, and he was condemned for conspiracy, but the House of Lords reversed the verdict. His reputation had suffered a blow from which it never recovered. Young Ireland broke with him, and in 1847 he died on his way to Rome. To repress disorder Peel carried a stringent Irish Arms Act. He also appointed a strong Commission of Inquiry under Lord Devon to investigate the land question, and it presented a searching report. As a palliative to Roman Catholic grievances in Ireland he increased the grant to Maynooth College, and established the three "godless" Queen's Colleges. The Protestant outcry, led by Sir Robert Inglis, was long and loud, and Mr. Gladstone, the Vice-President of the Board of Trade, resigned from motives that were not particularly intelligible.

**Lord Aberdeen's Diplomacy.**

Lord Aberdeen conducted foreign affairs safely and unsensationally. Friendship with France inspired his policy, and except for an absurd quarrel about Mr. Pritchard, a missionary and British consul at Tahiti, whom the French admiral ejected from the island, relations ran smoothly enough. He also ended a troublesome dispute with the United States by despatching a special embassy under Lord Ashburton, which settled the Canadian frontier on terms that were reasonably equitable to both sides (1842). The controversy over the Oregon boundary was sharper, and President Polk threatened war. However, after an interval of tension, negotiations were resumed, and in 1846 both parties signed a treaty which left Vancouver Island to the English, and admitted the two nations to the Columbia river.

Lord Ellenborough, a Governor-General whose boastfulness detracted from his ability, had meanwhile despatched Sir Charles Napier to conquer Scinde. He defeated the Ameers at Miani (February 23rd, 1843), and annexed the province to the Bombay

**The Scinde and Sikh Wars.**

A MODERN CERES: PEEL'S CORN LAW OF 1842.
*(Reproduced by special permission of the Proprietors of "Punch")*

Presidency. The Governor-General, however, came to loggerheads with the Directors, and in the following year he was replaced by Lord Hardinge. The collapse of the Sikh empire on the death of Runjeet Singh was followed by the invasion of British territory. Our forces under Sir Hugh Gough were hard put to it before the victory of Sobraon secured a treaty of peace, by which the child Duleep Singh was recognised as ruler of the Punjaub, with Sir Henry Lawrence as Resident.

The followers of Peel were becoming increasingly suspicious

Young England.

of his Free Trade tendencies. The first to revolt were the Young England party, with Mr. Disraeli and Lord John Manners as its most prominent members. They began to attack Peel in the session of 1844, which was marked by a Budget abolishing the import and export duties on wool. In the same year Mr. Goulburn converted a great part of the National Debt from 3½ to 3 per cent., and renewed the Bank Charter Act on terms that compelled the Bank of England to keep an adequate gold reserve and limited the issues of the country banks (p. 311). Discontent rose higher in 1845, when Peel, taking charge of the Budget, abolished the duty on raw cotton and 429 other articles, but did nothing, so the country members complained, for the agricultural interest. In the autumn the potato crop failed throughout Ireland, and grave differences of opinion divided the Cabinet. When Peel insisted on the suspension of the Corn Laws by an Order-in-Council, and their gradual abolition, Stanley and the Duke of Buccleuch resigned. Peel went down to Windsor and placed his own resignation in the Queen's hands. Lord John Russell, however, failed to form a Government owing to the refusal of Lord Grey, the son of the Reform Premier, to serve with Lord Palmerston, and Peel returned to office, replacing Stanley by Mr. Gladstone. On January 27th, 1846, he unfolded his plan, the proposal being that after the 1st of February, 1849, corn should be taxed at 1s. the quarter. Before that date the duty was to range between 10s. and 4s., according to price. Rallying round Lord George Bentinck and Mr. Disraeli, the Protectionists fought Peel with the resolution and vindictiveness of despair. Supported by Whig votes, however, Peel carried the third reading of the Corn Bill by a majority of 98, after a speech in which he assigned the merit of the economic revolution to Mr. Cobden. On the 25th of June the Protectionists found their revenge by joining the Opposition in voting against the second reading of the Irish Coercion Bill, and the Ministry fell. The system of party government seemed in imminent danger of disintegration.

Approach of Free Trade

G. LE M. GRETTON. The Army.

During the Napoleonic war money had been lavished by Parliament upon every branch of the military service. But when the troops returned in 1818 from the occupation of France they

found that the nation had grown weary of the soldiers to whose prowess in a great measure was due the proud position which England held among the nations of Europe. In peace time the

THE FREE TRADE HARVEST HOME; "PUNCH," MAY 30, 1846.
*(Reproduced by special permission of the Proprietors of "Punch.")*

army was virtually unrepresented in the Cabinet, and thus there was no minister to defend it against the attacks of the economists, who insisted upon an enormous reduction in military expenditure, carried out with complete disregard for military efficiency. The army was starved, both as regards the numbers in its ranks, and the supply of stores in its arsenals. So ruthlessly indeed was its *personnel* cut down that in 1821 only

Reduction after Waterloo.

101,000[1] men were left to defend the whole of the British possessions throughout the world. The Militia were disbanded, the Volunteers ceased to exist; thus behind the small regular army there were absolutely no reserves. Not more than half the troops were quartered in the United Kingdom; about 20,000 were in India, and the remainder garrisoned the colonies. It is said that the Duke of Wellington purposely stationed a very large proportion of the army out of England in order to keep them out of the sight of the public, among whom the old unreasoning dread of a standing army was still strong. Whether this is true or not, the fact remains that the policy of scattering the army in weak detachments throughout the British Empire was continued until 1870, when concentration, not dissemination, became the leading principle in the distribution of the forces.

Deficiency of Stores and Home Garrisons.

As regards stores, Wellington himself in his celebrated letter to Sir John Burgoyne, written in 1847, admitted that the supplies of guns, carriages, arms, ammunition, and *matériel* of every description were very inadequate, as successive Governments had been in the habit of disposing of these stores in order to reduce the amount of money which Parliament was annually asked to grant for military purposes. At this time war with France appeared imminent, yet only 30,000 men were stationed in the United Kingdom, a garrison which in the Duke's own words "would not afford a sufficient number of men for the mere occupation and defence, on the breaking out of war, of the works constructed for the defence of the dockyards and naval arsenals, without leaving a single man disposable" to take the field. Lord Palmerston in 1846 had warned his colleagues in the Cabinet that "this empire is existing only by sufferance and by the forbearance of other powers." But neither the energy of Lord Palmerston, the authority of the Duke of Wellington, nor the exertions of Sir John Burgoyne, could awaken the nation from its dreams of universal and unending peace. It was not

The Second Empire and the War Scare.

until 1851 that England was roused into a semblance of activity by the election of a nephew of the Great Napoleon to the Presidency of the French Republic. Then the Militia was revived, and 80,000 men speedily were enrolled in this the constitutional force of the country, while some steps were taken

[1] Exclusive of the Company's troops in India.

UNIFORMS OF THE 86TH REGT., 1842, AND 19TH REGT., 1848.

(J. Cannon: "Historical Records of the British Army.")

towards increasing the scanty numbers of the reserve of pensioners, instituted a few years previously. For the first time since 1815 an attempt was made to give some practical training in the field to the army at home. In 1853 8,000 men were assembled under canvas at Chobham. The officers and the men, no doubt, profited by their novel experiences in camp; but the Commissariat learned nothing, for the troops never ventured a day's march from the encampment; their horses and their carts were hired by the day, and their supplies were delivered on the spot by London contractors.

Recruiting.

For many years after Waterloo the army was thoroughly unprogressive; it rested on the laurels gained in the great war, and the best regiments were considered to be those which most closely adhered to the Peninsular standard. In some ways, indeed, the policy of the Horse Guards was distinctly retrograde. During the stress of the war with France, men had been allowed the option of enlisting for unlimited service or for comparatively short periods; but in 1829 these limited engagements were discontinued, and men were only enrolled for life-long service. As a great privilege, soldiers of thoroughly good character were permitted to purchase their discharge: as a punishment, men of especially bad character were expelled from the ranks with ignominy; but for the average private, until he should be invalided out of the army, there was no prospect beyond a life spent in unmeaning and monotonous details. Thus in 1829

"it took the whole of a man's time to clean his things! His lock was bright; his white trowsers were pipe-clayed; he was three-parts pipe-clay, brass-ball, and blacking."

Barracks.

If quartered in India, a soldier had, at any rate, the chance of the excitement of active service, for there were frequent campaigns in the East; but if his corps was in Europe or the Colonies, he dragged out his existence under conditions which to us appear simply revolting. The barrack-rooms were overcrowded, often without fireplaces; and until the Duke of Wellington became Commander-in-Chief, each bed was shared by two soldiers. In many barracks the beds were arranged in tiers, like berths on board a ship. To each man the Duke allotted a separate bed, and thus redressed a great abuse; but

another and a far greater evil remained for many years unremedied. No separate quarters were provided for married soldiers: they were obliged to live with their wives and children in the general barrack-rooms. The only partitions which gave these families even a partial privacy were extemporised out of rugs and blankets hung round their beds. On board the transports decency was even more outraged than on shore, for at sea the women and children slept in hammocks, slung among those of the men, without even a screen to separate them. In barracks the washing appliances seem to have been even more scanty than the sleeping accommodation. An army surgeon in 1846 says that for "want of all conveniences of this kind, soldiers frequently washed their hands and face by filling a small tin with water at the pump, from which a man takes a mouthful which is squirted out into his hands and subsequently applied to his face."

UNIFORM OF THE 7TH (THE QUEEN'S OWN) HUSSARS.

(*J. Cannon, "Historical Records of the British Army."*)

**Rations.**

The rations though sound in quality, were monotonous to a degree. Every day in the year (except Christmas, when the officers provided their men with a good dinner) exactly the same viands, cooked in exactly the same way, were served out respectively for breakfast and for the midday meal. No supper was provided, so that the men were almost driven into the public-houses, to drown in beer the hunger which assailed them every evening.

**Care of the Troops.**

Food for the mind, where any was provided for soldiers in the shape of libraries, was nearly as insipid as the eternal boiled

1846]

meat on which their bodies were fed. A sergeant describes the books provided for the troops at a large station in India as "very ill-chosen—a great number treated of abstruse, ethical, and doctrinal topics, much better calculated for the perusal of metaphysicians and divines." The same man incidentally mentions that at this station, where 1,200 Englishmen were cantoned, there was no Church of England chaplain, as the climate was considered too unhealthy for a clergyman to live in! In this connection it may here be stated that liberty of conscience in the army made a great stride in 1839 when it was ordered that no soldier who was a Roman Catholic or a Dissenter should be compelled to attend the Church of England, but that he should be at liberty to attend his own place of worship.

UNIFORM OF THE 9TH (THE QUEEN'S ROYAL) LANCERS IN 1841.

(*J. Cannon, "Historical Records of the British Army."*)

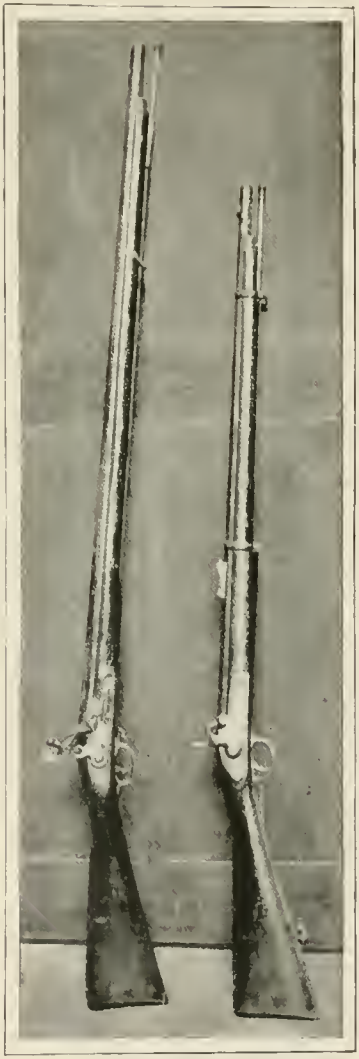
Although enlightened military opinion early in the century had declared against the abuse of the lash, flogging, though under ever increasing limitations, long continued to be in force in the British army. It was finally abolished in 1881: but as a matter of fact the cat, except on active service, and then only for acts punishable by death, had not been called into requisition for many years before its use became illegal. But during the first half of the century, when men misconducted themselves, they were either flogged, or imprisoned for terms varying with their delinquencies. Under the modern *régime* these sentences are now served in military gaols, where the soldier is kept absolutely free from the taint of civil prisons and civilian convicts; but before 1844 the men were confined in the common

Punishments.

Houses of Correction, and thus for purely military offences were condemned to associate with the lowest of the low. It is said that during the year 1833, not less than one out of every five men then serving in England passed through a civil prison. It is not surprising that to enlist for life into a service where men were so treated was regarded by the working classes as social suicide, and that parents preferred to see their sons in their coffins rather than in the uniform of her Majesty's army. In 1847 the system of life engagement finally broke down, and was replaced by enlistment for ten or twelve years. During the pressure of the Crimea and the Mutiny men were allowed to join for much shorter terms; and in 1870 the present principle of short service with the colours, and a further liability to serve while in the reserve, was definitely adopted.

**Musketry.** Although the accurate shooting of the British infantry had largely contributed to our victories in the Peninsula, musketry was entirely neglected during the dead period after Waterloo. "Soldiering in those days," writes a sergeant, "was all pipe-clay, drill, and discipline, and very little theory. 'Fire low, and hit 'em in the legs, boys,' was the extent of the instruction given to recruits.' In vain did Sir John Burgoyne urge the Government to construct ranges where the infantry could be systematically taught the use of their firearms. Nothing was done, and as late as 1852 it was considered sufficient for the Guards to fire thirty rounds of ball once in every three years, which in some of the battalions was expended in a very primitive fashion. Behind the bull's-eye painted on a canvas target was concealed a bottle, and every man who was lucky enough to hit the unseen bottle at 100 yards' range received a money prize! On the eve of the Crimean war the Horse Guards tardily realised the extreme importance of musketry, and ordered that in future every man should annually fire ninety rounds with the "Minié" rifle, which had just been adopted for the army. Owing, however, to official indolence in overcoming the 'great difficulties about ranges in this free country" which the War Office had already begun to experience in 1854, many young soldiers were sent to the Crimea who had never fired a shot in their lives before they found themselves in presence of the enemy. In 1855 the Minié rifle was superseded by the Enfield, which, about ten years later, was converted into the Snider, our first army breech-loader.

While the men were not taught to use their rifles, their officers were equally untrained to use their brains. As a rule, neither officers nor men knew anything beyond barrack-square drill; but this the soldiers knew to perfection, and the thorough discipline produced by its constant repetition stood them in good stead during the dark days of the Crimea and the Indian Mutiny. No steps were taken to teach young officers tactics or fortification, reconnoitring or military sketching; and ambitious men like Lord Wolseley, who voluntarily studied the theory and practice of his profession with equal zest, were few and far between. As there were no autumn manœuvres and no camps of instruction (except Chobham, in 1853), officers in England had no opportunity to learn the practical and all-important details which can only be acquired under canvas: and most of the troops who landed in the Crimea were so ignorant of everything connected with camp-life that they did not even know how to cook their food in the open air



BROWN BESS AND MINIÉ RIFLES.
(*Royal United Service Institution.*)

Regiments serving abroad had a far greater chance of learning the trade of war than their comrades in the United Kingdom, for the army in India had been fully occupied, and in many other parts of

**Campaigns during the Fifty Years' Peace.**

the world work had been found for British bayonets. Want of space renders it impossible to do more than mention the more important of these expeditions. Two campaigns on the Irawaddy (1824–26, 1851–52) transferred much territory from Burmah to Great Britain. The result of the third war against the Mahratta robber tribes (1818) was to give permanent peace to Central India. The hard-won conquests of Scinde (1843) and the Punjaub (1849) rendered our frontier

THE SIKH WAR: BATTLE OF FEROZESHAH.

*(From a sketch by Major G. F. White, in J. Cannon, "Historical Records of the 31st Regiment.")*

more secure against aggression from Central Asia, and added to our population splendid and warlike races, who are now among the most loyal of our fellow-subjects in the East. Russian intrigues involved England in a disastrous war with the Amir of Afghanistan (1839–42), memorable for the annihilation of our expedition in its retreat from Cabul (p. 163): when out of 4,500 men who attempted to fight their way back to India, but few survived to tell how a whole army had been cut to pieces by the wild tribesmen of the Khyber Pass. In South Africa the Kaffirs kept the garrison of Cape Colony frequently employed upon the frontier in weary and inglorious warfare (1819, 1829, 1834, 1850, 1853).

1846]

W. LAIRD CLOWES. The Navy.

During the long wars of the French Republic and of Napoleon, when Sir John Henslow, Sir William Rule, and Mr. Henry Peake were successive Surveyors of the Navy, our chief improvements in naval architecture were copied from the best of the very numerous prizes which we took from our enemies. Indeed, we followed this plan for many years after the peace. Thus, as late as 1845 we laid down at Devonport a *Sans Pareil* designed upon the lines of the ship of the same name which we took from the French in 1794; although, it is true, we never launched the new vessel as a sailing line-of-battleship, but lengthened her a little while she was still upon the stocks, and converted her to a screw ship of 80 guns, launching her as such in 1851. But long ere that day there had come into office a Surveyor who, although he still occasionally reproduced the beautiful and fast French models, was not content to be a mere imitator, and was, in fact, a really great naval architect. This was Captain Sir William Symonds, Kt., R.N., who held the office from 1832 to 1847. Born in 1782, he had reached the rank of Commander when in 1825 he was permitted by the Admiralty to construct a corvette upon lines which he had ventured to recommend to the attention of the Government. This ship, the *Columbine*, was so great a success, that as a reward for the improvements which he had introduced, her designer was posted in 1827, upon the conclusion of an experimental cruise which he made in her. But the Admiralty was in a sluggish condition, and was not prepared to advance further; and but for the Duke of Portland, who gave Symonds an order to build him a yacht, and to embody in her all such features as would conduce to speed and seaworthiness, the great designer might never have been in a position to rebuild much of the old wooden navy for the last time. The yacht *Pantaloon*, presently purchased by the Admiralty and adapted as a 10-gun brig, was such a striking triumph that Symonds was at once employed to build the *Vernon*, 50, *Vestal*, 26, *Snake*, 16 and other men-of-war, and was within a few months made Surveyor. In that capacity he built in the ensuing fifteen years no fewer than 180 vessels, all on the principle, more or less varied, of the *Pantaloon*. His ships owed their superior speed and stability chiefly to the improved form of their bottom, which he made much less heavy and full than had previously been usual. They were, moreover, broader, roomier, and loftier

The Last of the Wooden Walls

between decks than their forerunners; and in them the sailing navy of England undoubtedly found its very highest development. It is noteworthy that during his period of office not one of his vessels foundered, although not a few craft of other types did. Among his special glories were the *Queen*, 110, and the *Vernon*, which has been already mentioned. Another of his improvements was the introduction of the elliptical, instead of the circular or still older square stern. He also introduced a system under which the masts, yards, cross-trees, etc., of men-of-war were classified into twenty "establishments" or sizes, instead of into eighty-eight as before; and which was so ordered that the spars became interchangeable not only as between ship and ship of the same class, but also (though, of course, for different purposes) as between ship and ship of different classes.

**Steam in the Navy.**

But even while Symonds and his immediate predecessor, Sir Robert Seppings, were bringing the sailing man-of-war to its highest perfection, the use of sails was already doomed. Steam as a means of propulsion for ships had been used for a considerable period elsewhere, ere the Admiralty, ever a most conservative body, consented to try its merits. At length Marc Isambard Brunel (p. 280) succeeded in persuading their Lordships that they were behind the times, and that the use of steam must be countenanced even in the Navy. In consequence the *Comet*, a paddle wooden steamer of 238 tons and 90 horse-power, was built at Deptford in 1822, and presently the somewhat similar vessel *Monkey*, of 212 tons and 80 horse-power (I.H.P. 373), which had been built at Rotherhithe in 1821, was purchased for the use of the service. These and other early steam craft were either tugs, or what would now be called special service vessels; and it almost seemed as if the Admiralty were still determined to have as little as possible to do with them, for their construction did not come within the province of the Surveyor of the Navy; they were all purchased, or built by contractors: there was no regular corps of engineer officers to manage their machinery, the builders being expected to hand over with them the necessary engine-room staff; and at first not so much as the names of the vessels appeared in the official Navy List. But the new power soon forced itself into recognition. In 1832 the Surveyor designed his earliest steamers, among which were the paddle sloops *Tartarus*, 4 guns, 523 tons, 136 horse-power; *Prometheus*,

1846]

5 guns, 796 tons, 200 horse-power (and her sisters *Alecto*, *Ardent*, and *Polyphemus*); and *Gorgon*, 6 guns, 1,111 tons, 320 horse-power. There were also the *Merlin*, *Medusa*, *Medina*, *Acheron*, *Volcano*, etc., the earliest of which was launched in 1834 and the latest in 1841. All these were built of wood and had paddles as their propellers.

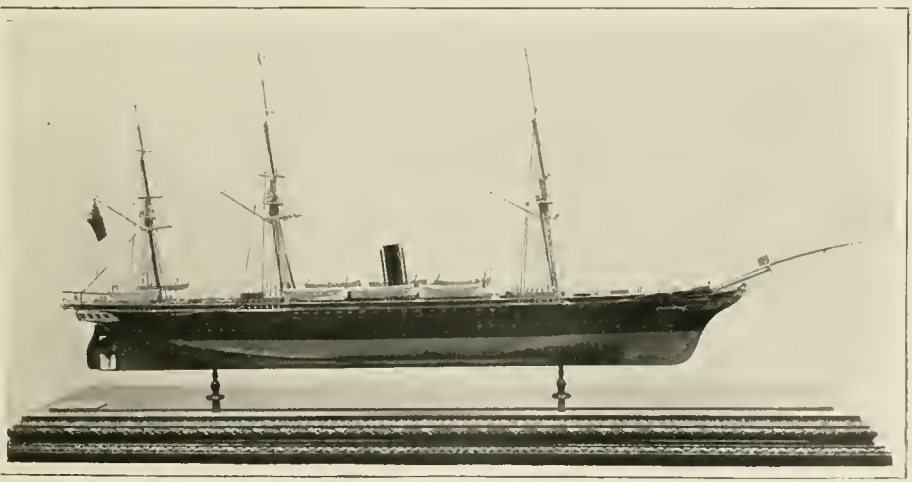
Iron Ships.

In the meanwhile iron as a constructive material, and the screw as a propeller, were attracting attention, in spite of the fact that their adoption, and even the making of experiments with them, were much opposed by the Navy, and particularly by Sir W. Symonds, who, able designer though he was, was full of unreasoning prejudices on the subject, and prophesied all sorts of evils if such innovations were made.

Iron lighters and similar craft were built in England quite early in the century; but no iron steam-vessels were constructed until 1821. In 1820 Mr. Aaron Manby took out a patent in France for iron steam-boats, and, with his friend Captain (afterwards Admiral Sir Charles) Napier, formed a Company, and began to construct the first boat at Horsley. She was not completed until the end of 1821. She was then sent to London in pieces, and put together in dock. Having taken on board a cargo of linseed and iron castings, she was put under the charge of Captain Napier, who navigated her from London to Havre, and thence to Paris. Mr. Manby, whose surname and Christian name had been given to the first vessel, afterwards constructed another craft of much the same kind at Horsley, and two more in Paris. From that time little advance seems to have been made until 1832. In that year the *Alburkha*, a little steamer of 55 tons, drawing only thirty inches of water, was prepared for the Niger Expedition; and almost simultaneously a larger craft, the *Lord William Bentinck*, was completed by Messrs. Maudslay, to the order of the East India Company, for service on the Ganges. She, however, was but 125 feet long and 22 feet broad. In the year following, the *Reine des Belges* was launched by Mr. Fairbairn at Manchester for use on the canal between Ostend and Bruges; and a considerably larger vessel, the *Lady Lansdowne*, was turned out by Mr. John Laird, of Birkenhead, for the City of Dublin Steam Packet Company. Although some of her forerunners proceeded to their destination by sea, the *Lady Lansdowne* appears to have been the first iron steamer deliber-

ately constructed with a view to occasional, if not regular, sea-service. She measured 133 feet in length by 17 feet in breadth; and she had a depth in hold of 9 feet 6 inches, engines of 90 nominal horse-power, and a tonnage, according to builders' measurement, of 148. In 1834 Mr. Laird built, and sent across the Atlantic, the *John Randolph*. She was transported piecemeal, and was put together again upon the Savannah river, where she was the subject of much curiosity, no iron steamer having been previously seen on American waters. These and other iron craft of about the same period were all paddle or stern-wheel vessels: nor was an iron screw steamer of any kind built until 1838, when Mr. Laird launched the little epoch-making craft *Robert F. Stockton*, which was fitted with an Ericsson propeller. She proceeded under canvas to New York, where for many years she was employed as a tug. Still the iron warship was entirely unknown. The first of the long series seems to have been the armed paddle steamer *Nimrod*, built for the East India Company by Mr. Laird in June, 1839. Exactly similar to her was the *Nitocris* of the same year; but both were small, being but 103 feet in length. They were, in fact, only gunboats. Other vessels more worthy of the name of warships were, however, launched from the same yard at the end of the year. These were the paddle steamers *Ariadne* and *Medusa*, of 432 tons, the *Phlegethon*, of 510 tons, and the *Nemesis*, of 660 tons. The last-named, built, like the others, for the East India Company, was armed with two 32-pounder pivot guns. Although she drew but five feet of water, she made the passage to India by way of the Cape of Good Hope; and subsequently, under the orders of Admiral Sir William Hall, she rendered excellent service during the operations in China. The British Admiralty did not possess an iron steamer until 1840, when the paddle packet *Dover* was launched for it at Birkenhead. In that year also it acquired three small iron paddle gunboats; but it hesitated for many years ere it made up its mind that, for large craft as well as for small, iron was a trustworthy material. In 1836 Mr. John Laird had proposed to construct an iron frigate, for which he prepared plans; but their Lordships were timorous, and declined to accept the offer. In 1842 he actually built and launched an iron paddle frigate of 788 tons; but the Government would

The *Fantôme* Brig.



The *Himalaya*. (*See p.* 182. *By permission of J. Hughes, Esq.*)

THE NAVY IN TRANSITION.

(*Victoria and Albert Museum.*)

have nothing to do with her, and she was eventually disposed of to Mexico. At length the Admiralty changed its views, the result being the launch at Birkenhead in 1846 of the ill-fated *Birkenhead*; the launch at Mr. Napier's Yard, Glasgow, in 1849, of the *Simoon*; and of the *Megæra* at Messrs. Fairbairn's Yard, Millwall.[1] These ships were at first classed as steam frigates, and armed as such; but experiments made upon an iron vessel called the *Ruby* induced the Admiralty to fear that they would be torn to pieces by the effects of shot upon them; and in consequence the ships were ultimately used as transports, their armament being greatly reduced. The tonnage of the *Birkenhead* was 1,400; that of the *Simoon*, 1,980; and that of the *Megæra*, 1,395. The first-named was fitted with paddles; the two last had screws. The general consequence was that up to the time of the Crimean War Great Britain possessed no iron fighting ships of any considerable size, iron being still regarded here as an unsuitable material to withstand the racking effects of shot striking, as they then did, at low velocities. The same views prevailed in France, but they had been less stringently applied: for as early as 1846 France launched a large iron screw corvette, *La Reine Hortense*, and the vessel seems never during her career on the active list to have been relegated to transport or other peaceful duties. But not until the introduction of armour-plating as a defence for ships did iron come into general favour, either in France or in England, as a material for the construction of the hull of a man-of-war. While its future still hung in the balance, another very important improvement, the screw propeller, had been finally adopted in lieu of the paddle, and still more of sail-power, as the sole means of propulsion.

**The Screw.**

Early in the nineteenth century Dr. Shorter devised a plan for driving vessels through the water by means of a circular fan, somewhat resembling the fan of the old-fashioned smoke-jack. It does not appear, however, that he had any

[1] The *Birkenhead* was wrecked off Simon's Bay, Cape of Good Hope, in 1852, when 454 persons perished, the crew and troops heroically maintaining perfect discipline till the last. The *Megæra* sprang a leak while conveying troops to Australia in June, 1871, and was beached on St. Paul's Island, in the Indian Ocean, where the crew and soldiers, with the women and children aboard, lived in huts for nearly three months. A Court of Inquiry declared that she had been unseaworthy, and censured several Admiralty officials.]

idea of having his propeller worked by steam. A generation later Mr. (afterwards Sir) Francis Pettitt Smith, who was a farmer at Hendon and the son of the postmaster at Hythe, turned his attention to the subject. In 1834 he constructed a model which was propelled by means of a submerged screw; in 1836 he took out a patent, and in 1838 he submitted his invention to the Admiralty. By that time Mr. Smith and the celebrated Swedish engineer, Ericsson, had become collaborators in the undertaking. The screw was applied to several small experimental craft, one of which, though only 45 feet long and 8 feet broad, towed a barque of 630 tons against a strong tide at a speed of nearly 4.5 knots; and later towed the Admiralty barge, with their Lordships on board, from Somerset House to Blackwall and back at an average speed of about 10 knots. But their Lordships, who included Vice-Admiral Sir Charles Adam, Rear-Admiral Sir William Parker, and Captain Sir E. T. Troubridge, curtly "declined to entertain the project" of fitting screws to naval vessels. These officers, in common with other people, appear to have been under the delusion that the screw was useful only in smooth water. An American gentleman, who had caused to be built for him the steamer *Robert F. Stockton*, already alluded to, also approached the Admiralty, but met with no better success, and recrossed the Atlantic in disgust. But shipowners were less blind than the naval officials; and in 1840 the *Archimedes*, a vessel of between 200 and 300 tons, fitted with Smith's screw, was launched, made the tour of Great Britain, and steamed without mishap to Oporto, Amsterdam, and other places. Her performances at length converted the obdurate Admiralty. In 1842 there was laid down for the Navy at Sheerness Yard a sloop named the *Ardent*. The Admiralty ordered her to be lengthened aft, to be fitted with a screw, and to be re-named *Rattler*; and as such she was launched in April, 1843. She was 176 feet long, 32 feet 8½ inches broad, and of 888 tons; and she was given engines of 200 nominal horse-power. Her after-part was of a form very unsuited to assist the work of the propeller; yet she was so much of a success that, from the day of her trials, the future of the screw in the Navy was assured. Its future in the mercantile marine had been earlier decided; and the construction within a short period of the ocean-going screw steamers

*Bengal* (2,250 tons), *Simla* (2,600 tons), *Colombo* (1,900 tons), *Himalaya* (3,500 tons), and many more large craft, soon proved that the value of the invention was as great for big ships as for small. The form, pitch, number of blades, and other details of the screw have undergone, and will continue to undergo, modification; but the general principles of the designs of Smith and Ericsson have been, and are likely to be, retained throughout.

At first already existing vessels belonging to the Navy were fitted with the screw, after having undergone lengthening and other modifications for the purpose. Several very old ships of the larger classes were thus treated, including the *Ajax*, launched in 1809; the *Horatio*, launched in 1807; and the *Nelson*, launched in 1814. The first line-of-battle ship that was designed *ab initio* for the screw was the *Agamemnon*, of 50 guns. She was laid down at Woolwich Dockyard in 1849, and launched in 1852: and she it was that in 1857–58 was employed in the laying-down of the original Atlantic Cable.

W. H. HUTTON The Church.

THE history of religious progress during this period is concerned primarily with the Church of England. From a purely historical standpoint the importance of Roman Catholicism, save for a brief moment, is practically negligible, while the prominence of the different bodies of Protestant Dissenters is slight when compared with their power in parts of the seventeenth and eighteenth centuries. This history can naturally be considered from two standpoints—(i.) the relations between Church and State, and (ii.) the growth of the Oxford or Tractarian movement.

Church and State.

I. The years succeeding 1833 brought nearer the necessity for important reforms. In 1834 Sir Robert Peel, as Prime Minister, said:—

> "If by an improved distribution of the revenues of the Church, its just influence can be extended and the true interests of the established religion promoted, all other considerations should be made subordinate to the advancement of objects of such paramount importance."

A Royal Commission to "inquire into the Revenues and Patronage of the Established Church of England and Wales" afterwards reported to the king on June 16th, 1835. The

1846]

report showed that the net revenues of the archbishopries and bishopries of England and Wales were £160,292, of the cathedral and collegiate churches £208,289, of the separate revenues of the individual members of the chapters £66,465, of benefices (the number being 10,718, including sixty-two sinecure rectories), £3,055,451. The average salary of a bishop was about £6,000, but this was reached by the enormous revenues of some of the sees (such as Durham, £19,066), while others were under or

THE NAVE, RIPON CATHEDRAL.

just above £1,000, and had to be supplemented by the holding of other appointments *in commendam*. Among benefices the greatest inequality prevailed. While there were 1,629 under £100 a year in value, there were 134 of between £1,000 and £1,500, 32 over £1,500 and under £2,000, and 32 over £2,000; the value of Stanhope, a parish covering a very large area of thinly populated country, being £4,813, with a population of 4,800. On this report was based an Act of Parliament passed in 1836, which re-arranged certain dioceses, and appointed an Ecclesiastical Commission to carry out various recommendations chiefly of a financial nature. The revenues of the sees and the

**Endowments Re-adjusted.**

chapters were readjusted on a more equitable basis. Two new sees, Manchester and Ripon, were created. Later on, many wholesome, or at least wholesale, reforms were effected in the case of the capitular bodies. Bishop Blomfield of London, a prelate of great vigour, desired to abolish 360 of the cathedral prebends, and succeeded in taking away all their revenues. The rearrangement of the incomes and duties of the residentiary canons met with the strongest opposition, both from Sydney Smith on its material and Dr. Pusey on its intellectual and spiritual sides. The opposition was to some extent successful, and the cathedral bodies were allowed to retain a staff and an income sufficient to enable them to remain, or become, the mother churches of the dioceses in provision for instruction, for the fullest dignity of worship, and for the support of learning. "The cathedrals," said Pusey, "have been the nurseries of most of our chief divines, who were the glory of our English name; in them these great men consolidated the strength which has been so beneficial to the Church." These and similar reforms, including a large step in the direction of the equalisation of benefices, have been carried on by the Ecclesiastical Commissioners in the period since 1840. In 1838 the Tithe Commutation Act was passed, which removed a considerable grievance. Politically the period admitted to civil privileges all those who stood outside the Church.

**Convocation Restored.**

Later incidents in the relations of the Church to the State may be conveniently summarised here. In 1852 Convocation, which had remained in a state of suspended animation since the reign of George I. (Vol. V., p. 549), again entered upon formal discussion. "The old machinery which had been unused for 135 years—mainly, it must be confessed, through the carelessness and want of information of the clergy themselves—was again put in motion. That the Crown had long ago violently interfered to dismiss the Convocation, and that there had never been since then any desire or encouragement on the part of the State for the clergy to meet in their synods, constituted in fact the whole of the obstruction which had so long prevented the action of Convocation."[1]

**Roman Aggression.**

In 1850 the country was startled by the issue of a Papal brief creating an archbishopric of Westminster and dividing

[1] Archdeacon Perry, "History of the Church of England," 3rd Period, p. 307.

1846]

England into twelve Roman Catholic dioceses. An extraordinary popular ferment ensued. Lord John Russell produced an Ecclesiastical Titles Bill, which was opposed by Mr. Gladstone on behalf of the Church, which considered it unnecessary and unwise to resist the aggression by an appeal to the power of the State. The Bill was much modified before it became law, and John Leech in *Punch* happily sketched the Prime Minister

LORD JOHN RUSSELL AND THE ECCLESIASTICAL TITLES BILL.

*(Reduction of Leech's Cartoon. Reproduced by special permission of the Proprietors of "Punch.")*

as "the boy who chalked up 'No Popery!' and then ran away." In 1855 a Royal Commission reported in favour of some very considerable changes in regard to the bishoprics and cathedral chapters; but no legislation resulted. Subsequent years, from 1860 onwards, were also marked by some serious contentions as to the relation of the civil courts to the Church, and by much discussion ending in the appointment, in 1867, of a Royal Commission to consider the ritual adopted of recent years in several churches, and the bearing upon it of the rubrics of the Prayer Book and the laws of the land.

**Disputes on Ritual.**

The Oxford Movement

II. Such was the external history of the Church. The internal was far more important and significant. A new movement, starting from Oxford and led by young tutors of the University, inspired a new life into the Church. "On Sunday, July 14th [1833]," says Cardinal Newman, "Mr. Keble preached the Assize sermon in the University pulpit. It was published under the title of 'National Apostasy.' I have ever considered and kept the day as the start of the religious movement of 1833."[1] Recent attacks on the Church, especially the suppression of the Irish bishopries, seemed to Keble to call for a solemn protest against what appeared likely to become a "direct disavowal of the sovereignty of God." It was a solemn pronouncement against the "liberalism," in its anti-religious aspect, which Newman so greatly dreaded. In July a party of like-minded men met at Hadleigh Rectory, at the request of the Rev. Hugh James Rose. This was followed by the formation of an "Association of Friends of the Church" at Oxford; and in February, 1834, by the presentation of an address to the Archbishop of Canterbury, signed by 7,000 clergy, assuring him of their adherence to the doctrine, government, and formularies of the Church. A similar address signed by 23,000 laymen followed. The men round whom the movement centred were Hugh James Rose, William Palmer, John Keble, Richard Hurrell Froude, and John Henry Newman.

Hugh Rose was a Cambridge scholar of eminence, a literary man of acknowledged power, and a parish priest of devoted life. William Palmer was a learned man whose studies in the history of liturgies and whose valuable book on the offices of the English Church were supported by a "compact and defensible theory" of the "peculiar constitution of the English Church." John Keble had the highest University reputation, was already famous as a poet, and was a man of saintly life and uncompromising adherence to principle. Richard Hurrell Froude was an impetuous and critical genius in love with medievalism and abhorrent of the "defacements" of the English Reformation. John Henry Newman was poet, preacher, philosopher, and endowed with a marvellous attractiveness which soon gave to the movement its great popular strength. Originally an Evangelical, he had learnt the doctrine of Apostolic succession,

[1] "Apologia," p. 35.

1846]

and from Dr. Hawkins, the famous Provost of Oriel, that of tradition.

At first it was the adhesion of Keble which gave to the new movement its greatest power. "Keble," says Dr. Liddon,

CARDINAL WISEMAN, BY THOMAS BRIGSTOCKE.

*(By permission of the Lord President of St. Cuthbert's College, Ushaw.)*

"unlike Newman, had been a High Churchman all his life. His powerfully constructive mind grasped from the beginning the strength of the Anglican position as opposed to Protestantism and Rationalism, as well as to the yet unappreciated power of Romanism. He saw, as he stated in one of the earliest Tracts, that the Apostolical succession was the essential bond, recognised by sixteenth and seventeenth century divines, associating the

English Church through Reformation and Papal dominion with that primitive Catholicism in which Anglicans laid their foundations, and to which they had always appealed. He was never conscious of being an innovator. And with this firmness of conviction and principle he was able, in spite of his retiring disposition, not only to strike heavy blows in controversy, but on occasion to head protests and even agitations." The strength of the party was completed by the adhesion of Dr. Pusey, Regius Professor

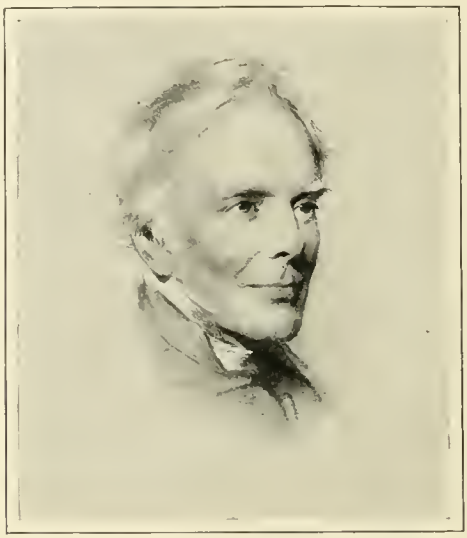


*Photo: Walker & Cockerell.*

REV. JOHN KEBLE, BY GEORGE RICHMOND, R.A.

(*National Portrait Gallery.*)

of Hebrew at Oxford, whose vast learning and recognised position gave to the associated friends at once "a position and a name."[1]

Antecedents of the New Party.

The intellectual origin of the party is not difficult to trace. It arose partly from the long and unbroken line of traditional teaching which passed back, through the great divines of the Caroline age, behind the Reformation, to the accepted theology of the undivided Western Church. This was quickened into new life by the renewed interest in the past evoked by the genius of Walter Scott, and fostered by the playful satire of

[1] "Life of Pusey," i., p. 271.

Thomas Love Peacock. Medieval life and art were seen to be not the rude offspring of a dark age, but to teem with romance and generous enthusiasm. The past was painted as in many ways more simple, more generous, more beautiful, and more Christian, than the present. A second influence, in its way no less powerful, was the new philosophy of Coleridge and his school. He was "a great force in making men dissatisfied with the

*Photo: Walker & Cockerell.*

CARDINAL NEWMAN, BY MISS EMMELINE DEANE.
(*National Portrait Gallery.*)

superficiality so common a hundred years ago in religion as in other matters; and in this, if in no other way, he prepared the English mind to listen to the Oxford teachers."[1]

Historically it will be seen that the Oxford Movement, like all other similar movements in the past, brought into special prominence a doctrine which the age had neglected. The Oxford teachers were filled with a deep feeling of the importance and the wide consequence of the Christian doctrine of the Holy

[1] "Life of Pusey," i., p. 254.

Catholic Church. It was this that linked them to the great divines of the English Church. It was this which gave the extraordinary motive force to the movement now inaugurated. As conversion, assurance, and individuality were the powerful and appealing principles of the Evangelical revival, so the sense of inheritance and of communion in one historic body belonged to the Tractarians.

The history of the movement can only be briefly sketched. It acted first through the publication of a series of "Tracts for the Times," which were first popular explanations and appeals to the great theologians of the English Church, then lengthy and learned treatises on the chief doctrines of the Church which had seemed in recent years to be ignored. They had a large sale and a wide and increasing influence. Their work was aided by the issue of a number of pamphlets on the chief religious and political questions of the day, and by the influence of the poetry of Keble, of Newman, of F. W. Faber, and of Isaac Williams. But they were by no means universally welcomed. The "high and dry," as well as the Evangelical, school of Oxford dons were first cold, then bitterly opponent. The powerful party led by the revered and beloved Dr. Arnold regarded them with suspicion which gradually grew into rancorous condemnation. "It is clear to me," wrote Dr. Arnold to his friend and pupil Stanley, "that Newman and his party are idolaters." A counter-move began about the same time as the Tracts, from the Broad Church party (as it came to be called), to remove all tests at the University, particularly the signing of the Thirty-nine Articles by undergraduates, a requirement introduced 250 years before by Elizabeth's Puritan favourite, the Earl of Leicester.

**The Broad Church Party.**

Considerable influence in the direction of liberalism in theology was also exercised by the very interesting personality of the Rev. J. Blanco White, who in January, 1835, became a Unitarian.[1] He was the real founder of the modern Latitudinarian school in the English Church. Whately and Hampden were in different senses his pupils; Arnold and even Hawkins felt his positive influence, though less directly.[2] In 1836 the divergence between the two parties was made manifest by the strong opposition which greeted the appoint-

[1] *See* J. B. Mozley's "Essays." [2] Liddon's "Life of Pusey," i. 360.

ment of Dr. Hampden to be Regius Professor of Divinity at Oxford. So strong was the opposition to this appointment, from Evangelicals as well as High Churchmen, that the new Professor was deprived by the University of a large part of the rights and powers of his office. Gradually opposition to the Tracts became systematised, and charges of "Romanising" were freely made against their contents, especially after the

THE REV. F. W. FABER.
(*Brompton Oratory, South Kensington.*)

publication (after his death) of R. H. Froude's "Remains." On the other hand, Dr. Hook, who was doing an extraordinary work of evangelisation at Leeds, powerfully defended the Tracts.

In 1841 the opposition was brought to a head by the publication of "Tract 90," in which J. H. Newman, Vicar of St. Mary's, Oxford—the great preacher whose influence over undergraduates, and through them over a larger field, was inspiring and widespread—argued that the Thirty-nine Articles do not, historically or formally, contradict the formularies of the Council of Trent, and are not in necessary or absolute contradiction to the doctrines to which the Church of Rome is (in 1841) necessarily

Tract XC.

committed. Similar attempts had been made before, and there was nothing but the excitement of the times to render the tract significant of anything more dangerous than brotherly charity and a desire for the use of accurate theological language. But four Oxford tutors at once issued a protest against it, which was taken up by the Heads of Houses. The Tracts were disowned by the University authorities, and "Tract 90" was

JOSEPH BLANCO WHITE.
(*From his "Memoirs," edited by J. H. Thom.*)

condemned as evading rather than explaining the Articles. A long and exasperating controversy followed. Many of the bishops took fright and condemned the Tracts. The powerful influence of Mr. Keble and Dr. Pusey was exerted on behalf of Newman in publications whose honesty and learning could not be denied. Yet the tide turned strongly against the Tractarians. In 1843 Dr. Pusey preached a sermon on the Eucharist before the University, which was condemned with extraordinary haste and some disingenuousness by the Heads of Houses, and the author was suspended from preaching in

[1846]

his turn. In 1843 Newman resigned his living of St. Mary's; and after two years' retirement at Littlemore, near Oxford, he was received into the Church of Rome in October, 1845. In 1841 by a State arrangement a bishop for the English and German congregations in Syria was consecrated by the Archbishop of Canterbury (Howley). The apparent recognition of Lutheranism and Calvinism implied in this, though the English

EDWARD BOUVERIE PUSEY, D.D., BY GEORGE RICHMOND, R.A., D.C.L.

*(By permission of the Dean and Governing Body, Christ Church, Oxford.)*

Church had given it no formal sanction, was a severe blow to the Tractarians. In 1844 Mr. W. G. Ward, Fellow of Balliol, perhaps the most original of the Tractarian party, published "The Ideal of a Christian Church," in which the Church of England appeared to be compared disadvantageously with the Church of Rome. The Heads of Houses determined on a further condemnation of Tractarianism. The Convocation of the University was summoned. Ward's book was condemned by 777 votes to 386. His degree was taken away by 569 to 511. A proposal formally to condemn "Tract 90" was stopped by the veto of the

Ward's "Ideal."

The Crisis.

Proctors—Mr Guillemard of Trinity, and Mr. Church[1] of Oriel. This was the crisis of the movement. It was on February 13th, 1845, that the condemnation took place. In September Ward became a Roman Catholic; in October, Newman. Many others followed. A new stage of the movement began from that moment. Of the chief leaders, Pusey and Keble remained firm, and won ever-increasing influence as the years went on. The cause was taken up and carried on boldly by a crowd of enthusiastic spirits, of whom some, it is true, deserted it as time went on, but the greater number remained firm in the English Church. Among these Manning, the Wilberforces, and Church, with Gladstone and Roundell Palmer[2] among laymen, exercised in different ways a powerful influence on the theology and the practical work of the English Church. The principle on which these men acted has been expressed by one who was perhaps the wisest of them all:—

"It was not the revival of the old Via Media; it was not the reassertion of the superiority of the English Church; it was not a return to the old-fashioned and ungenerous methods of controversy with Rome—one-sided in all cases, ignorant, coarse, un-Christian in many. It was not the proposal of a new theory of the Church—its functions, authority, and teaching, a counter-ideal to Mr. Ward's imposing 'Ideal.' It was the resolute and serious appeal from brilliant logic and keen sarcasm to reality and experience as well as to history, as to the positive and substantial characteristics of the traditional and actually existing English Church, shown not on paper but in work, and in spite of contradictory appearances and inconsistent elements; and, along with this, an attempt to put in a fair and just light the comparative excellences and defects of other parts of Christendom, excellences to be ungrudgingly admitted, but not to be allowed to bar the recognition of defects."[3]

Such principles, with different expression, animated the army of parish priests and University tutors who now carried on the teaching of the Tractarians. Dr. Pusey, in spite of censures and misrepresentation, continued to teach the doctrines of the Continuous Church, and by active beneficence and counsel aided in the founding of many new mission works for dealing with the social and religious difficulties of the time. Mr. Keble continued to write powerfully in favour of the principles of the movement, and lived universally respected in his country living of Hursley till his death in 1866.

[1 Afterwards Dean of St. Paul's.] [2 Afterwards Earl of Selborne.]

3 Church, "Oxford Movement," pp. 366–7.

LITTLEMORE CHURCH, NEAR OXFORD.

HURSLEY CHURCH AND RECTORY.

Two Great Churchmen.

If two men be selected as examples of the active work of the period, they would naturally be Dr. Hook, whose labours in the immense parish of Leeds gave an impetus to parochial work throughout England, and Samuel Wilberforce, who was consecrated Bishop of Oxford on November 30th, 1845. This great prelate, endowed with many popular gifts, with untiring energy and marvellous power of organisation and practical work, may be said to have created a new conception of the episcopal office. "According to him the bishop was to be as much the mainspring of all spiritual and religious agency in his diocese as a parochial clergyman is bound to be in his parish."[1] No less was he prominent in the business of the National Church, in Convocation, and Parliament, and in the encouragement of the great extension of missionary effort. That he was not always judicious, and that he had no claim to learning, would be admitted; but few would deny that he was the greatest prelate of the age.

JOHN BROWN. The Free Churches, 1815-1885.

The history of nineteenth-century Nonconformity may most fitly begin with some account of the "Three Denominations," as they were called, represented by the three boards of Presbyterian, Independent, and Baptist ministers, which in 1727 were organised as a "General Body." From the time of the Revolution they had a sort of acknowledged position in the State with the privilege of approaching the Throne and presenting an address. Of these three the Presbyterians were at first the more numerous body, and were accorded precedence. They traced their origin back to the time of the Long Parliament, and are not to be confounded with the present Presbyterian Church in England, which had a recent origin from Scotland, and is one in doctrine as well as in polity with the Church of the north. The older community, while retaining the name Presbyterian, gradually drifted from their ancient theological positions into Arianism or Socinianism, preferring to call themselves Unitarians, and had for their leaders men like Dr. Priestley, Theophilus Lindsey, and Thomas Belsham. Outside London they were in the early years of the nineteenth century strongest in Liverpool, Manchester, York, Birmingham,

The Unitarians.

[1] "Life of S. Wilberforce," i. 344.

Norwich, and Bristol. Elsewhere their hold upon the people was but feeble. In 1830 their own organ, the *Monthly Repository*, candidly reported: "Our chapels are but thinly attended . . . Many of the old places amongst us are in a pitiable state. Of our own knowledge we can speak of some scores which scarcely show signs of life." But while Unitarianism has never had powerful hold of the common people, it has, on the other hand, well sustained its reputation for culture and

KEBLE'S RESTING-PLACE, HURSLEY CHURCHYARD, HANTS.

literary power, numbering among its adherents Priestley, Aikin, and Roscoe, Mrs. Barbauld, Joanna Baillie, and Crabb Robinson. Norwich Unitarianism was brilliantly represented by the Taylors, Martineaus, Starks, and Aldersons, who were worshippers at the Octagon Chapel, where also Mrs. Opie attended as a girl: and at Birmingham, the Hills, from whom came Sir Rowland, the Post Office reformer, were prominent supporters of the Presbyterian Meeting-house.

**The Independents.**

The Independents, the second of the Three Denominations, while agreeing with the Unitarians in repudiating all State control of religion, were at opposite poles from them in matter of faith and church polity. With the Methodists they he firmly to evangelical truth, but differed from them in main-

taining the autonomy of each separate church. Such church, they held, should consist only of spiritual persons, and being so composed has complete power of self-government, the officers and private members together making one corporate ecclesiastical body, not acknowledging any right of interference or control from without. Gradually, in the course of the present century, the descriptive name "Independent" has given place to that of "Congregational," the older term of the two, and the one that was used in the sixteenth century. It was indicative of a growing feeling in favour of a closer combination of the churches, which, without interfering with their cherished freedom and right of self-government, should bring them into closer fellowship with each other. Out of this feeling arose the association of Independent churches known as the Congregational Union of England and Wales, formed in 1832. The following year the Union adopted a declaration of faith, church order, and discipline, not as having authority over the churches, or as a standard to which assent should be required, but simply as a statement of the leading principles held by the denomination. During the present century the Congregationalists have made steady advance in numbers, having now 4,594 churches and mission stations: also in the possession of improved church buildings and schools; in the development of their collegiate system for the training of ministers; in enlarged missionary operations both at home and abroad; and in the creation of various benevolent and educational agencies for their people. Many of their ministers, of whom there are nearly three thousand, have exerted an intellectual influence on the community at large. Heads of colleges, such as Dr. Pye-Smith, Dr. Vaughan, Dr. Halley, and Henry Rogers have been recognised leaders in the world of thought; while preachers like Richard Winter Hamilton, James Parsons, Dr. Raffles, John Angell James, Dr. Leifchild, Thomas Binney, R. W. Dale, and Alexander Raleigh acquired enduring reputation far beyond their own borders.

**The Congregational Union**

**The Baptists.**

The Baptists, the third of the Three Denominations, differ from the Congregationalists simply on the question of the mode and subjects of baptism. They also have come into a brotherly federation known as the Baptist Union, and have been growing in numbers and influence as the century has

proceeded. Like their Congregational brethren, too, they have had names among their ministers held in deserved honour by the Universal Church: William Carey, the pioneer missionary; Robert Hall, the brilliant preacher; Andrew Fuller, Charles Haddon Spurgeon, Alexander Maclaren, and many more who

JOSEPH STURGE.
(*After Alexander Rippingille.*)

have exercised a powerful formative influence over the religious life of the community.

The Wesleyans.

Passing beyond the historic denominations just referred to, we come next to the powerful society known as Wesleyan Methodism, which, born in the eighteenth century, went on developing and consolidating in the nineteenth. Its internal history is largely that of a struggle for greater freedom and increased representation in the government of the Society on the part of the laity. Neither Wesley nor the other early

leaders in Methodism believed in democratic government, and continued resistance on their part to the introduction of the lay element into Conference led to one secession after another, forming sister communities holding the same doctrines, and having substantially the same polity, but working with more of breadth and democratic freedom. In one form or another the question of the place of the people in the government of the church came to be agitated till 1877, when the ministerial and lay elements were harmonised by a system of lay representation, which provided a mixed Conference, consisting of about 240 ministers and 240 laymen, in whom the government was ultimately vested.

In spite of several secessions and occasional disasters Wesleyan Methodism has shown marvellous vitality, elasticity, and resource. In 1822–3 a great revival in Cornwall added more than 2,000 members to the Society within a few weeks. Ten years later Conference reported the accession of 24,000 new members in one year in Great Britain and Ireland, and nearly 2,000 more on their foreign stations. Even when the Reform agitation of 1849 had entailed serious discord and heavy losses in numbers, the Society not only soon rallied itself but rose stronger than before. In the course of the following years enlarged congregations called for enlarged church accommodation, week after week bringing intelligence from almost every part of the Connexion of new chapels erected or old ones increasing their accommodation At the centenary celebration of 1839 the people raised for colleges, mission-house, and other buildings no less a sum than £230,000; at the jubilee of their Foreign Missionary Society in 1863 they raised £250,000 more, and in 1878 a further Thanksgiving Fund of £290,000. Their numbers in Society also, as well as their contributions, in spite of secessions and fluctuations, rose steadily from decade to decade; so that while in 1816 they had in Great Britain and Ireland a membership of 241,319, in 1843 that membership had reached a total of 451,286—in other words, had nearly doubled itself.

The principal offshoots from the Wesleyan system are the Methodist New Connexion and the Primitive Methodists. The former of these was a secession led by Alexander Kilham in 1797, in which there were two points at issue: the relation

**Dissentient Methodists: The New Connexion.**

of the Wesleyan Society to the National Church, and the place of the laity in the internal government of the Society. At first the Methodist preachers were not allowed to administer the sacraments, inasmuch as Wesley regarded the community he had founded simply as a Society connected with the Church of England; and for the same reason services were not to be held in the Methodist chapels at the same hours as those in the parish churches. These restrictions were felt to be

ALEXANDER KILHAM

*(By permission of the Methodist New Connexion.)*

increasingly irksome and inconvenient, and those who seceded with Kilham contended for the right of the people to hold their services at times convenient to themselves, irrespective of the services in the National Church; and also for their right to receive the sacraments at the hands of their own ministers, and in their own places of worship. These points were conceded by Conference shortly after the death of their founder, but the further constitutional question of the place of the laity in the government of the Society continued to be the subject of agitation for three-quarters of a century longer. The seceding members of 1797 maintained the right of the people to a representation in the district meetings and in the

Annual Conference, and so to have a voice in the government of the Society and in the appropriation of its funds; they claimed also on behalf of the general body the right to vote in the reception and expulsion of members, in the choice of local officers, and in the calling out of candidates for the ministry.

**Primitive Methodists.**

A much more important community arising out of secession was that of the Primitive Methodists, which took its rise in 1807. Two earnest-minded men in Staffordshire, Hugh Bourne and William Clowes, joined the Methodists, and caught the spirit of revival. They had read of American Camp Meetings, and resolved to hold a similar gathering at Cop Mow, or Congleton Edge, an elevation of millstone grit dividing Staffordshire from Cheshire. The scene was memorable from the excitement produced: other meetings followed, and the excitement spread. Methodist preachers disapproved of the proceedings, and Conference passed a minute to the effect that even supposing such scenes were allowed in America, in its judgment they were highly improper in England, likely to be productive of considerable mischief, and were to be discountenanced. Hugh Bourne took no notice of the inhibition thus pronounced, but went on holding camp meetings as before; consequently, in the following June he was expelled from the Society for violating Methodist law. Undeterred by this excommunication, Bourne and Clowes instituted a society of ten members, and met in class in 1808. In 1811, when their membership did not number more than 200, they built a chapel and determined to call themselves Primitive Methodists. With admirable self-devotion they went to work among the poorest and most degraded of the people in town and village. They had not a college-bred man among them: their preachers endured the sorest privations without a murmur: the world despised them, and as they heard them preach and sing called them Ranters: still they grew, sweeping over England and penetrating everywhere. Like the preaching friars of the Middle Ages, wherever they found an opening they set up a service, and anything was good enough for a pulpit—a wagon or a cart, a chair or a heap of stones. Driven from one place they escaped to another, singing as they went. The persecution they endured was disgraceful. The rabble knocked down the preachers and threatened with oaths to take their lives. This

persecution, however, only furthered the movement: congregations were gathered; class-meetings were held in which many who had lived abandoned lives told with tears how God had lifted them out of the horrible pit and the miry clay; and men who used to fight together sat down at the love-feasts of the Society, and one after another told the story of a life-time. It was a memorable movement. The adherents were nearly all working people—fisher-folk, persons employed in mills, collieries, and mines, or as labourers on the land—and the Society grew in a wonderful way. The ten members of 1808 have grown to 200,000; they have 4,000 chapels and 16,000 local preachers, and the good accomplished among the poorest and the lowliest, among those to whom the consolations of religion are most welcome, is simply incalculable.

**The Society of Friends.**

Other less numerous communities, such as the Society of Friends, the Moravians, the Irvingites, the Plymouth Brethren, and the adherents of the New Jerusalem or Swedenborgian Church, can only be briefly touched upon in the space at our disposal. The Society of Friends has in the course of the period now under review steadily declined in numbers, and was further weakened by the Hicksite controversy, which began in America in 1825, and in 1829 was creating anxiety among the Quakers on this side of the Atlantic. Still, in the manifestation of all the social virtues, and in the advance of all philanthropic movements, they have exerted an influence out of all proportion to their numbers as a denomination. Honoured names have been among them—William Forster, the Gurneys of Earlham, Thomas Clarkson, the Sturges, Benjamin Seebohm, John Dalton and William Allen, Joseph Lancaster and Joseph Fox; these and many more have stood firmly for justice and righteousness, for the advancement of science and freedom, and for the promotion of education and Christian philanthropy.

**The Moravians.**

The Moravians, or, as they describe themselves, the *Unitas Fratrum*, the United Brethren, trace back for centuries to John Huss and the Bohemian Reformation; but were as a denomination first established in this country by Count Zinzendorf in 1732. In 1800 they had settlements in Bedford, Bristol, Dukinfield, Bath, and Devonport, these settlements being really small colonies, "the Brethren" living together in village life, with schools and industrial institutions, under the govern-

ment of their own Church. Their ecclesiastical polity is somewhat peculiar: for while they have bishops, their government may be described as Presbyterian rather than Episcopal, inasmuch as Synods, provincial and general, are the ruling powers, the provincial synod directing provincial affairs and legislating in detail according to principles laid down by a General Synod. While their numbers have been small, and their churches not more than forty in this country, it is their great honour to have been the pioneers in missionary enterprise in Greenland, Labrador, the West Indies, South Africa, and among the aborigines of Australia. At the beginning of the century, out of 170 ministers 100 were missionaries, and, taking their whole community, one in every *sixty* members is a missionary as compared with one in 5,000 in the other Protestant Churches generally. They had also missions to the lepers before Père Damien was born, for in 1818 the Brethren undertook a settlement for these unfortunate sufferers in the African valley of Hemel en Aarde. They are not an increasing community; their old congregations and their old settlements continue to exist, but make but little progress.

The Catholic Apostolic Church, as the Irvingites designate their own community, took its rise out of the ministry of Edward Irving, originally of the Scottish Presbyterian Church. Described by De Quincey as by many degrees the greatest orator of his time, and by Carlyle as "the freest, brotherliest, bravest human soul mine ever came in contact with," he came to the conviction that the phenomena connected with the descent of the Holy Spirit at Pentecost might, if men had faith, be repeated in our own time, and the miraculous gifts of the primitive Church renewed. A new church, necessitated by his great popularity, had been built for him and opened by Dr. Chalmers in 1829, and in 1831 strange scenes were witnessed and supernatural voices supposed to be heard. In 1833 he was excommunicated by the Presbyterian Church, of which he was a minister, and on his return to London he officiated as an angel in the congregation of the Catholic Apostolic Church. This Church, which was the outcome of Irving's peculiar views, laid great stress on the Ecumenical Creeds of Christendom, and held to the belief in our Lord's Second Coming before the Millennium. It was mainly distinguished by its fourfold ministry of apostle, prophet, evan-

CONVENTION OF THE ANTI-SLAVERY SOCIETY, BY BENJAMIN ROBERT HAYDON.
*(National Portrait Gallery.)*

gelist, and pastor, the apostle taking precedence of the rest, claiming to confer the Holy Ghost by the laying on of hands, to communicate to the Church mysteries revealed to himself, and to decide matters of discipline and order. There were also deacons to manage temporal affairs, while the payment of tithes or tenths of property was the source of church revenue. The system grew to be as churchly in its way as the churches of the East and West, and as æsthetic in its ritual. Seven congregations were commenced in London made up of gathered converts, one of these taking high rank in later years within the walls of the ornate cathedral built in Gordon Square. The most distinguished of their adherents was Henry Drummond, M.P., a man of bold individuality, having the courage of his convictions. At his seat of Albury Park, which was a gathering place for students of prophecy, he built in his grounds a place of worship for the new denomination, the decorations of which were extremely rich, and in which the chair of the angel, or bishop, occupied by Lord Sidmouth, stood on the north side of the chancel.

*Photo: Walker & Cockrell.*
EDWARD IRVING, BY JOSEPH SLATER.
*(National Portrait Gallery.)*

**The Plymouth Brethren.**

Between the years 1820 and 1830 a new form of religious conviction and profession rose against the formalism and ecclesiasticism of the time, which came to be known as Brethrenism, and from an early place of meeting, Plymouth Brethrenism. Mr. Groves, a young man of ardent piety preparing for the Episcopal ministry at Trinity College, Dublin, came to have doubts as to the course he was taking, and in consequence gave up the study of general literature, sacrificed his property, and cast himself on Providence. He and some others of like mind came to the conclusion that all existing ecclesiastical systems were wrong, that Christendom was in confusion, and that the day of the Lord was at hand. They also held that believers in Christ should frequently meet together to break bread inde-

THE CHANCEL, CATHOLIC APOSTOLIC CHURCH, ALBURY PARK.

pendently of any clerical ministration. Mr. Groves had for his associate John Nelson Darby,[1] a man of considerable learning and force of character, but somewhat narrower and more exclusive than himself. It is not easy to convey any very distinct idea of the principles adopted by the Brethren, they having published no confession of faith and issued no declaration of ecclesiastical order. While professing to take the New Testament as their rule, their testimony was more negative

JOHN NELSON DARBY.

(*From a drawing, by permission of Colonel Le Pelley.*)

than positive. They protested against worldliness, and especially against Churchism, esteeming Episcopalianism, Presbyterianism, and Independency to be all alike wrong, the Establishment being Apostasy, and Dissent no better. Their main positive manifesto is that the Lord is at hand, and that till He comes the Holy Spirit is the present sole and sufficient sovereign in the Church.

Swedenborgianism may be said to have first come within the circle of English ecclesiastical life as the New Jerusalem Church, about 1810, when a society was formed for circulating

[1 For a striking account of him in early life, *see* F. W. Newman, "Phases of Faith," p. 27 *seq.*]

Swedenborg's works. As far back, however, as 1754 the Rev. J. Hartley, a Northamptonshire clergyman, published treatises and translations on the subject, and the Rev. John Clowes, of Manchester, who died in 1831, wrote works in defence of the system, though he still remained a clergyman of the Church of England. At the religious census of 1851 the Swedenborgian places of worship had a total of 11,465 sittings, and 4,846 persons in attendance. The system rested on the peculiar claim of its founder to have been in the spiritual world and to have talked with angels face to face in their own habitations. His books are the revelations of what was thus professedly communicated to him. This remarkable man, of noble character and educated mind, presents a strange mixture of fanaticism and cool reasoning. Holding to a mystic meaning in Scripture, of which he alone had the key, and to the idea that everything in the world is full of *correspondences*, he thought that the true explanation of Scripture will proceed beyond the literal to the spiritual, and recognise the correspondences everywhere existing between the three worlds of Nature, of the True, and of the Good.

The Salvation Army, though coming into existence during the period covered by this volume, really received its principal developments later than the year 1885.

H. D. TRAILL. Literature.

A Brief Retrospect.

Several years before the commencement of the period whereon we now enter, the burst of song with which the eighteenth century had closed and its successor opened was finally hushed, and by 1832 it may almost be said that even its echoes had died away. Byron had been eight years dead, Shelley ten, and Keats eleven. Scott's muse had been silent for well nigh twenty. The best that was in Wordsworth had been uttered. Coleridge had almost wholly fallen silent, and the genuine, if not very opulent, vein of poetry which his son Hartley (1796-1849) had inherited was denied its full development in a nature marred by weaknesses which were themselves also, unhappily, paternal bequests. Poetry of respectable, if of minor merit, is not wanting, it is true, to the literature of this decade, but none of it, whatever its quality, can be regarded as in any sense carrying on either the lyrical tradition of the first three of the above-

named poets or the poetico-romantic tradition of the fourth. Their performances were almost all in the nature rather of adventures in new directions than of progress along the path marked out by their predecessors. In only one of them, Thomas Hood (1798–1845)—and in him only in those early pieces which public neglect compelled him to abandon for the essentially inferior work of burlesque verse—is there to be noted any deliberate endeavour to follow in the footsteps of the earlier masters. Of the two other poets whose names, though held in very unequal estimation in their life-time, deserve alike to be mentioned even in a brief summary of this kind, one and the greater in original genius lived too short and undisciplined a life to justify any attempt to fix his place definitively in the literature of his age. But both the single work which Thomas Lovell Beddoes (1803–49) produced in his short life of less than fifty years and the series of works which were the yield of Henry Taylor's (1800–86) long life of nearly ninety years were dramatic in form. And though the latter attained to a certain measure of reputation during the decade which we are considering (his masterpiece, "Philip van Artevelde," was not published till 1834), whereas the former remained in complete obscurity for many years after his death, it cannot be said that even Taylor himself was in any sense popular. Perhaps the only poet who, during this period, made any deep impression on the public mind was Philip James Bailey (1816–1902), whose long philosophical poem of "Festus," published in 1839, has preserved such a measure of literary life as to justify the republication of a "Jubilee" edition of it in 1889.

THOMAS HOOD (*Portion of Painting*).
(*National Portrait Gallery.*)

If the honours, such as they are, of popularity can be claimed

at all for any poetry, or so-called poetry, during the period in question they must be taken to have descended in the female line, for probably the most widely read writers of verse at that period were Felicia Hemans (1793–1835) and Letitia Elizabeth Landon, better known to her contemporaries under the initials "L. E. L." Profound mediocrity is the note of both ladies, and their smooth and facile numbers—varied in the case of the former only by a few pieces of higher merit—would, in these days of abundant and admirable versification, not infrequently rising to the level of genuine poetry, pass quite unnoticed. That either of these two elegant but wholly uninspired songstresses should have found acceptance by a public in whose ears the music of Keats and Shelley was still echoing is a melancholy proof of the essential worthlessness of popular fame.

Popular Poetry in 1830.

Poor, however, as was the quality of the verse produced during these years, it must be admitted that the first efforts of the new poet who was destined to become the glory of his age revealed no striking superiority of gift. In 1826 appeared the small but now historic volume entitled "Poems by Two Brothers," a collection of weakly imitative lyrics, from which no one certainly would have guessed the illustrious future which lay before one of the joint authors, or the genuine, though of course far slighter, poetic inspiration which was to find utterance in the other. It is not now possible to distinguish the share of Alfred Tennyson (1809–92) in this early venture from that of Charles; but the fact is the less to be regretted since the dead level of mediocrity is maintained uniformly throughout, and in no one number of the volume can the most sympathetic criticism detect the faintest individuality of touch. There are echoes of Byron and of Scott; there is even an echo of Moore;

*Photo Walker & Cockerell.*

FELICIA DOROTHEA HEMANS, BY ANGUS FLETCHER.

*(National Portrait Gallery.)*

The Tennysons' Early Efforts

but the unmistakable music of that voice which was to charm two generations of Englishmen, and to retain its sweetness and power unimpaired until, nearly seventy years later, it was stilled for ever, is nowhere to be heard. Never since Apollo took service with Admetus has the godhead of an Immortal been so effectually concealed.

Alfred Tennyson's Earliest Book.

It was not till 1830 that Tennyson again broke silence, nor can it be said that even in the volume published by him in this year the promise of his future greatness stood as yet assured. For although in the collection entitled "Poems Chiefly Lyrical" are to be found a few such masterpieces as "Mariana," "The Dying Swan," "The Merman," and "The Mermaid," yet in the collection of poems published two years later, when the poet was still only in his twenty-third year, he reached a level of lyrical perfection, on which he stood side by side, not only with Keats and Shelley, but with the greatest English lyrists from the Elizabethan era downwards, and above which he did not, as indeed it was inevitable that he should not, rise during the sixty years of creative activity that still remained to him. One has but to mention the names of "The Lotos Eaters," of "Œnone," of "The Palace of Art," and of "The Dream of Fair Women," in order to remind oneself how early the greatest, the most individual, and most lasting triumphs of the poet were achieved. For of but one among these four masterpieces can it be said that it shows any lingering traces of that imitative stage through which even poets of the most independent and original genius sometimes have to pass. "The Palace of Art" is no doubt strongly reminiscent of Keats, but in "The Lotos Eaters" a note new in English lyrical poetry was struck, just as in "Œnone" the young poet showed that the possibilities of the blank-verse measure had not been exhausted by Milton, and stamped it anew with a rhythm of his own which is more fluent and flexible, more varied and versatile—though unfortunately, too, more easily imitable and more copiously imitated—than that of his great predecessor. In 1842 Tennyson added to the list of his published poems, among many others, his great philosophical poem, "The Two Voices": the romantic, but in sentiment slightly commonplace, "Locksley Hall"; the two fine blank-verse pieces, "Ulysses" and "Godiva"; and the splendid fragment of the "Morte d'Arthur." His detractors in the press

were now silenced, and his rank as the foremost of living English poets was assured to him.

Much behind him in reputation stood in those days a poet who, in the closing years of his life, was to challenge an almost **Browning.**

ALFRED TENNYSON IN 1844, BY SAMUEL LAURENCE.

equal place. Robert Browning (1812–89) was born three years after Tennyson, and was about as much his junior on the Muse's calendar. "Pauline," his first poem, appeared in 1833, a work which has not, even now in the day of his fame, found many admirers, and was followed two years later by "Paracelsus,"

a poem in the dramatic form and of far more remarkable quality, exhibiting, indeed, both in matter and manner, nearly all the most characteristic points of its author's genius. Though as profoundly and unpoetically analytic as anything that he ever wrote, it is redeemed by passages of beauty which are almost wholly wanting to the relief of "Sordello," published in 1840, perhaps the harshest in expression and obscurest in theme of all the poet's productions. It may be conveniently dwelt upon for a moment longer here, as representative of an aspect of Browning's poetry, which it retained almost unaltered to the last. Perfect lucidity and simplicity, a sufficient charm of music and imagery, and a passion and power of dramatic insight unsurpassed, if equalled, either by predecessor or contemporary, were often at his command and were many a time displayed by him in his shorter lyrical pieces. But during the whole of his sixty years of poetic activity he habitually disdained to lend any of these attractions to his longer blank-verse poems. To the last it was the poet's whim to lead his reader into unlighted caverns of thought strewn thickly with obstacles of language, and to leave him to grope and stumble his way through them as best he might.

Up to the end of the period covered by this chapter Browning had published scarcely anything—unless we except a few of the pieces appearing in the collection entitled "Bells and Pomegranates," issued in parts between 1841 and 1846—which gave promise of his lyrical as distinct from his analytic and philosophising powers; and the accomplished poetess whom he married in the year with which this period closes had not then attained that fame which for nearly another twenty years was to eclipse that of her husband. Between 1832 and 1846 there were no poets, with the exception of the female mediocrities above-mentioned and perhaps also Mr. Philip James Bailey, who contested Tennyson's monopoly of public attention as a poet. The name of Sir Aubrey de Vere (1788–1846) is alone worthy of mention as a poet of true charm and refinement: for that of Ebenezer Elliott, the so-called "Corn Law Rhymer" (1781–1849), though he probably had more of the "root of the matter" in him than any man living at that time save Tennyson and Browning, is almost necessarily excluded by the self-chosen narrowness of his themes and by their fiercely polemical treatment from any

Minor Poets.

prominent place in such a chronicle as this. One might almost wish that the Corn Laws had been repealed twenty years earlier, in order to see how it might then have fared with Elliott's poetic development, were it not that in that case he would probably never have sung at all.

Prose: Macaulay.

The prose of this period was as remarkable in point of accomplished work as its poetry was rich in promise; for in the course of its fourteen years it witnessed the rise almost to the full height of their fame—and perhaps quite to its summit in one case—of two of the greatest prose writers and one of the two greatest novelists of the century, in the persons of Macaulay, Carlyle, and Dickens. The first of these had already made his mark in periodical literature before the period began. Macaulay (1800–59) was indeed a contributor to the *Edinburgh Review* in the second decade of the century, and had already elicited the well-known and often-quoted eulogy of Jeffrey on the novelty and brilliancy of his style. The essay on Milton appeared in 1825, and thenceforward for the space of twenty years Macaulay contributed to the great Whig periodical a series of articles which, although, according to the tradition then and still observed by the *Review*, ostensibly literary criticisms, were in many or most cases elaborate biographical studies of statesmen, sovereigns, philosophers, and men of letters, or comprehensive surveys of past periods of history. They occasionally suffer in some measure from the circumstances of their production; and the manifest intrusion of political bias (or, as in one famous case, of downright personal animosity) into some of them detracts from their value; but, excluding a few of the more or less "occasional" articles—such as that on "Southey's Colloquies,"

EBENEZER ELLIOTT.
(*From the engraving prefixed to his Poems*, 1840.)

"Essays."

"Croker's Boswell," "Gladstone on Church and State," and the celebrated onslaught on Mr. Robert Montgomery—the remainder may be safely ranked among the enduring monuments of English literature. In the essays on Lord Bacon and Sir William Temple, in the two brilliant sketches of the elder Pitt and his contemporaries, and, above all, in the magnificently dramatic presentment of the administration and the trial of Warren Hastings, Macaulay's literary genius—with all its brilliant fervour of rhetoric, its consummate mastery of intricate narrative, and its lucid, if too often prejudiced, analysis of character and motive—is seen at the height of its power. His activity of production was uninterrupted even by those four years of official service in India, during which he acquired that local knowledge and that familiarity with Oriental life which stood him in such good stead in the last-named essay; he continued to display it as untiringly after his return to India in 1838.

"Lays of Ancient Rome."

Some four or five years later, in 1842 and 1843, he made his first appearance as a poet with the "Lays of Ancient Rome"—a work which has been variously judged by critics, but which, though not attaining to and indeed not aiming at the simplicity of the ancient ballad poetry, is animated, especially in its battle-pieces, by a sustained ardour which it would not be easy to match anywhere save in the romance poetry of Sir Walter Scott.

"History of England."

After a short interval of Parliamentary and official work, Macaulay lost, in 1847, his seat for Edinburgh, and a year afterwards published the first two volumes of his "History of England," thus invading a field at that time occupied almost solely by his older contemporary—a fellow-Whig, Henry Hallam (1777–1859), one of the most learned and judicious, but also one of the coldest and least inspiring, of writers. Its third and fourth volumes appeared in 1855, and two years later its author was raised to the peerage. He died in 1859, leaving this monument of his genius uncompleted. The brilliancy of the essayist displays itself with undiminished lustre in the historian; and there are passages in the history not surpassed even by the most eloquent pages of the essays. But the constitutional defects of the critic and biographer are still more conspicuous in the writer of history. The vehement prejudices which occasionally distorted his view of the philosopher or the man of letters who had been the subjects of

1846]

his study perpetually disable him from dealing fairly with the statesman or the policy with whom and with which it was now his business to deal; and though these prejudices never indeed betray him into deliberate deviations from ascertained truth, they constantly tempt him to exaggerate or to minimise the effect of historical evidence, and—what approaches

*Photo: Walker & Cockerell.*

LORD MACAULAY, BY SIR FRANCIS GRANT, P.R.A.
(*National Portrait Gallery.*)

nearer still to positive untruthfulness—to build up a theory of the character and motives of individuals upon the basis of a series of mere presumptions which the reader is allowed, if not encouraged, to mistake for facts.

His Influence on English Prose.

The place, however, of Macaulay, elevated as it is among English men of letters, is less commanding than his rank among those who have influenced the history, as well as enriched the possessions, of our national literature. No writer of any age—not Dryden, or Johnson, or Gibbon—has left a deeper mark than Macaulay upon English prose. It is hardly

too much to say that his influence is visible, to an extent amounting sometimes almost to actual mimicry, in nine out of every ten men who followed the craft of literature during the period immediately succeeding his death; and though it has of late been waning somewhat before the attraction of newer models, it is still to be quite plainly traced. Macaulay's style had, in fact, that combination of individuality and adaptability which is the secret of any great prose-writer's influence upon his time. Accomplished, attractive, and even great as such a writer may be, his style must have a new and personal stamp, or it will not arouse the desire or beget the unconscious trick of imitation; yet with all its originality it must be such as will adapt itself to the needs of many varieties of literary temperament, many different degrees of literary power, and to the capacities of all kinds of literary material, or the imitator, unconscious as well as conscious, will, with or without knowing, abandon it for some more useful model. Macaulay may, as Professor Saintsbury thinks, have taken something from Hazlitt in the formation of his style, and "not a little from Gibbon"; and undoubtedly there is a family resemblance in what has been irreverently called the "see-saw of the sentence" in both writers. But Macaulay shortened the sentence, sharpened the antithesis, and familiarised the language; and in so doing made it possible for a host of successors to cultivate point and epigram while avoiding the appearance of sham and elaboration, and taught them to lend to rhetoric which is in reality quite as artificial as Gibbon's an air of the natural and sincere. At a time when the genius of English prose, with the fascinating but dangerous models of De Quincey and Wilson before her, might easily have run into somewhat loose-zoned excesses of the luscious in phrase and colouring, Macaulay gathered up her garments and girt her loins. The reaction towards a greater restraint and austerity of style which he thus set on foot was needed and was healthy, and it has not yet quite spent itself even now, when Macaulay has been over forty years in the grave.

Carlyle.

Widely different in literary manner, and infinitely less influential as a literary model, stands the other famous essayist and historian, if either name can be properly given to one whose essays were usually poetic and satiric rhapsodies, and his

1846]

history a series of brilliant dramatic monographs, interspersed with prophetic sermonisings on the enigma of existence and the nature, lot, and destiny of man. Thomas Carlyle (1795–1881), the son of a Scotch stonemason, was originally intended for the Church, which he abandoned first for the drudgery of an ushership in various Scotch provincial schools, and finally,

*Photo: Walker & Cockerell.*

THOMAS CARLYLE, BY SIR J. E. MILLAIS, BART., P.R.A.
(*National Portrait Gallery.*)

after an interval of private tutorship, for the less monotonous but more precarious employment known to an elder generation as "writing for the booksellers." Between his twenty-fifth and his thirty-fifth years he did much miscellaneous work in the way of translations and contributions to periodicals, but the first production which brought him into notice was the strange rhapsody, as it was then considered, to which he gave the name of "Sartor Resartus," and which, under the form indicated by its sub-title of "The Life and Opinions of Herr Teufelsdröckh," is in fact a sort of spiritual autobiography of Carlyle

"Sartor Resartus."

himself. Though accepted courageously enough, and published in a serial form in their miscellany by the conductors of *Fraser's Magazine*, its success, as may be imagined, was not immediate; nor was it until after the publication of another and more popular work that it won its way to anything like general appreciation. But from the first it caught the attention of the few independent critics and thinkers who were able to penetrate through what seems to an unfamiliar eye its uncouth and forbidding style to the core of wisdom, humour, and poetry that lay within. In these qualities, apart or in combination, it has been held by many—and the opinion, though not incontrovertible, is strongly founded—to be richer than any other of its author's works.

**"The French Revolution."**

In the year 1837 appeared the "History of the French Revolution," and by this work the place of Carlyle in English literature was permanently fixed and obtained general recognition. The dramatic vigour of its narrative, the vivid force of its portraiture, the reach and grasp of its generalisations, and the brilliancy and power with which the historian's theory, inadequate and biassed as it may have been, of the great catastrophe was supported, were irresistible. Later researches have corrected many of Carlyle's statements of fact; a wider survey of the social and economic conditions of the revolutionary France has revealed the limitations of his own historical outlook, and his too narrow conception of the causes of the events with which he was dealing; but the supreme artistic value of this magnificent work remains unimpaired. It remains, and will always remain, an imperishable monument of the power of literary genius in enabling the average human imagination to realise, with an intensity which would otherwise have been impossible to it, one of the greatest and strangest dramas that have ever been enacted on the human stage.

**Lectures and Essays.**

The lectures on "German Literature," on "The History of European Literature," on "Revolutions," and on "Heroes and Hero-worship," followed in pretty rapid succession, and were followed by the collection and publication of the "Miscellaneous Essays," the volume on "Chartism," and the remarkable series of political studies contained in the volume entitled "Past and Present," and published in 1839. And in the last year but one of the period with which we are dealing there appeared

THE ATTIC STUDY, CARLYLE HOUSE, CHELSEA.

*(By permission of the Committee of Management of the Carlyle House Memorial Trust.)*

"Cromwell." another, the third of the three great works which stand at the head of Carlyle's productions, "The Letters and Speeches of Oliver Cromwell"—a pious, and to a considerable extent successful, attempt to rehabilitate the memory of the great Protector, which revealed in a fulness only to be surpassed in the vast enterprise of his later life Carlyle's untiring industry in the collection of materials and the singularly acute insight with which in certain circumstances he could handle them.

Carlyle's Place in Literature. In dismissing for the present this most powerful and original of writers a word must be said of the place which he occupies in English letters. It is in no sense, as was Macaulay's, that of a model and exemplar, or of a contributor to the formative influences by which the future character of a national prose is determined. On his first appearance as a writer there were those who thought or rather feared otherwise, and who augured the gravest danger to English prose from the example and influence of a style so "barbarous," as it seemed to them, so widely deviant from accepted models, and so rebellious from classical canons as was that of Carlyle. Time has shown, however, that these fears were exaggerated, and that, as might indeed have been expected, a literary manner so incapable of adaptation to the uses of the average writer—in whom alone one must mainly look for the influences of contemporary models—would never be widely imitated except for purposes of deliberate parody. Accordingly, while no one, perhaps, has been so frequently or successfully parodied in the course of the last half-century than the author of "The French Revolution," there is no writer of his power and popularity who has had fewer conscious or unconscious imitators as distinct from parodists. Perhaps the reason is that unconscious imitation of so marked a manner would be difficult almost to the point of impossibility, and that to imitate it consciously, and at the same time with a serious intent, would be as nearly impossible for anyone having any consciousness of the absurd. Carlyle, it is true, was himself accused in his early days of being, so to speak, his own imitator — that is to say, of deliberately following out a deliberately invented scheme of literary eccentricity. His peculiarities of manner, these accusers declared, were not

natural to him; they were affected of set purpose as a means, and an unworthy means, of arresting public attention. Ample proof of this was to be found, they alleged, in the fact that in his earlier pieces Carlyle wrote, as they put it, "just like anybody else."

A fairer criticism however, will lead one to the conclusion that it was not his earlier manner—as displayed in the periodical to which he contributed at the outset of his career, and for the readers of which he was bound (and no doubt editorially reminded often enough) to put restraint upon himself—but his later manner which was really natural to him. If the style is the man, it is not in "The Life of Schiller," but in "Sartor Resartus," that we must look for the real Carlyle. It was in the style that he adopted, or rather mounted, for himself in "Sartor" —with its formless sentences, its abrupt breaks and harsh inversions, its strange metaphors and its fantastic vocabulary—that he found the adequate, and doubtless the only adequate, expression of his rich and varied genius. For him, as has been said in a recent study of his literary characteristics—for Carlyle, "with his throng of commanding faculties—his fiery eloquence, his rugged pathos, his grim and caustic humour, his unrivalled talent for word portraiture and picturesque description—all struggling, sometimes almost simultaneously, to express themselves, there was but one possible language—the Carlylese. And whatever may happen to the 'claim of style,' whatever may become of the 'dignity of history,' we may be sure that so long as eloquence and pathos, and humour, and vivid portraiture, and picturesque description retain their power to move and delight mankind, Carlyle's place in the admiration of posterity will be secure."

Dickens.

Far foremost among the novelists of this period, and, in certain respects, easily chief of all the writers of fiction of the Victorian era, stands Charles Dickens (1812–70), the greatest of whose works, with a single exception, were published during the nine years with which the period closes. "The Pickwick Papers," which, originally commenced in 1836, grew rapidly under its author's hand into a masterpiece of broadly farcical comedy, appeared in its completed form in 1837, and was succeeded in the following year by "Nicholas Nickleby." "The Old Curiosity Shop" and "Barnaby Rudge" made their appearance in 1840–41,

and "Martin Chuzzlewit" in 1843. The first work of this brilliant series established the popularity of Dickens, and revealed his extraordinary gift of humour to almost, if not quite, its full extent; but it can hardly be said that the range and variety of his powers were demonstrated until the completion of the series. There was nothing in the boisterous fun of "Pickwick," or even in the extravagant, if droll, caricatures with which "Nicholas Nickleby" abounds, to foreshadow the astonishing vigour of dramatic narrative which animates the story of the Gordon Riots in "Barnaby Rudge," or the mastery of genuine, if sometimes recklessly unjust, satire which informs the American scenes in "Martin Chuzzlewit." Still less are there any traces in the earliest books of that purely literary quality which, in spite of Dickens's extensive ignorance of, and, as it should seem, profound contempt for, accepted literary models, no competent critic can fail to recognise in the work of his prime.

His Humour.

Of his humour it is singularly difficult for criticism—as many unsuccessful attempts have proved—to render a strictly just account. In some of its aspects it is as easy to undervalue as it is in others to over-estimate it. Of all the greater humorists of the world there is none whose humour, relatively to the extraordinary width of its outlook, is so singularly lacking in penetrative power. His wealth in this quality is indeed ample, but it is laterally, not vertically, disposed. To compare Sterne with Dickens is like comparing the owner of a small but richly yielding mine with the proprietor of an immense but light-soiled estate. The one sinks deep shafts into his little plot of earth, while the other seems to have hardly more than scratched the surface of his broad acres. It is this lack of depth in the Dickensian humour which has led many in their disappointment to dismiss it with too hasty disparagement as "caricature." There is justice in the sentence, but not complete justice; for though caricature is almost invariably its basis, and in "Pickwick" forms its whole stuff and substance, there is much more in its best examples than mere exaggeration of the comic aspects of character at the expense of proportion and truth. Still it remains the fact that many, and those the most famous, of his humorous portraits are not so much portraits of men as they are idealised studies of incarnate "humours" in the sense

in which Ben Jonson uses the word. They have not the wholeness, the complete humanity of Falstaff or of My Uncle Toby; they are simply human vices, or human foibles personified to the exclusion of every other human attribute. There must have been more in Peecksniff than hypocrisy, pomposity, meanness; more in Mrs. Gamp than garrulity, greed, dishonesty; more,

*Photo: Walker & Cockerell.*

CHARLES DICKENS IN 1855, BY ARY SCHEFFER.

(*National Portrait Gallery.*)

perhaps, even in Squeers than brutality, ignorance, and impudent conceit; yet this is all of these characters that we are ever permitted to see. Realist as Dickens supposed himself to be, and in his descriptive method actually was, he is, dramatically speaking, an idealist pure and simple. He drew not individuals, but types; he dealt, not with concrete realities, but with abstract qualities; and strange as it may seem, the characters of this prose humorist must be viewed as we view the purely ideal creations of the poet, if we would do justice either to him or to them. For it is only by thus studying these characters that we can fairly measure that inexhaustible wealth of comic imagination, that unflagging zest and dexterity of humorous portrayal, which

carries captive the reader's judgment, and compels him for the time to share their creator's belief in their existence.

His Pathos and Tragedy.

Of the pathos of Dickens it is impossible to speak with the same confident admiration. Much more seriously and much more frequently than his humour did it suffer from those remarkable lapses of self-restraint, and that singular incapacity of self-criticism, which make themselves felt at intervals throughout the whole of his literary work. And whereas his humour, even where through extravagance it overshoots its mark, is almost always genuine to start with, his pathos, on the other hand, is more than occasionally false. Like Sterne before him, he succeeds best where he is least self-conscious and deliberate in his appeals to the reader's sympathy. It is where, like Sterne with his Maria, he "lays himself out" to be pathetic, as with his little Nells and little Pauls, that his failure is the most disastrous. But in his command of the tragic and the terrible he has been rarely equalled. The scene in which he places, and the atmosphere with which he surrounds, his incidents of horror, are conceived and rendered with tremendous power, and it is in these, perhaps more than in any other parts of his writings, that the consummate literary art of which he was the not always sufficiently acknowledged master, is the most strikingly displayed.

Thackeray's Early Works.

The greatest works of his greatest rival do not fall within the period with which we are dealing—his masterpiece, as by many it is considered, having been only commenced in serial form in the year with which that period closes. It is best, therefore, that detailed notice of him should be reserved for the succeeding chapter. But though Thackeray (1811–63) was hardly known to the public of the early 'forties otherwise than as a writer of humorous sketches for the then infant comic periodical press, we must not forget that to this early phase in the development of his genius belongs that most masterly study of the character of the unscrupulous adventurer—hardly even now appreciated at its full worth—which alone should have sufficed to give the author a leading place not only among the novelists of his century, but among the greatest analysts of human character and motive that the modern world has produced. "Barry Lyndon" is a work which Balzac himself at that date had hardly equalled, and which certainly he never surpassed.

In 1843, however, the taste for such penetrating studies of character had not arisen; it had indeed to be created in a large measure by Thackeray himself. Romance, except in so far as it had been displaced by the novel of humour in the hands of Dickens, was still, as was only natural during the decade succeeding the death of Scott, the most popular form of fiction, and Thackeray for some years to come had still—as is recorded in a well-known anecdote—to endure its most successful professor's jovial condolences on the public neglect of his infinitely superior work. William Harrison Ainsworth (1805–82) and G. P. R. James (1801–60) were then at the height of their somewhat cheaply earned fame. The former, though inferior to his rival in strictly literary merit—if indeed that quality can be correctly attributed to either of them—is by much the more animated and attractive writer of the two. In pure storytelling power, in dexterous arrangement of dramatic situation, and in dash and rapidity of action, he often shows himself, indeed, to be no unworthy, if no conscious, imitator of Dumas; as in fact he also recalls that great romancer in his utter indifference to the higher arts of characterisation, and his complete contentment with a set of *dramatis personæ* possessing no more life than is necessary to carry them through a series of stirring adventures. James, a more avowed and obvious follower of Scott, had also a faint touch of Scott's romantic spirit; but almost all his novels are of that one inadmissible *genre* defined by the French critic as *le genre ennuyeux*. And the intolerable slowness of their movement as individual stories was hardly compensated by the speed with which they followed one another from his too prolific pen. Romance: Ainsworth and James.

A man of far wider culture, and of infinitely greater versatility, was Edward Lytton Bulwer (1803–73), afterwards raised to the peerage under the title of Lord Lytton. Indeed, if versatility were everything, and the power of writing well in many forms, if supremely well in none, were to be taken as the test of excellence, he would be beyond all competition the foremost writer of his age. The fashionable novel, the novel of crime, the historical novel, the romance of the supernatural, the domestic novel, the novel of social satire, the novel of speculative fantasy, the comedy, the melodrama, the historical drama—at each and all of these forms of imaginative writing he tried his Bulwer Lytton.

hand during his half-century of literary activity, and in every instance with a success to which "Pelham," "Paul Clifford," and "Eugene Aram," "The Last of the Barons" and "The Last Days of Pompeii," "The Caxtons" and "My Novel," "Kenelm Chillingly," "The Parisians" and "The Coming Race," remain to testify in the literature of the study, as do "Money," "Richelieu," and "The Lady of Lyons" in that of the stage. It has been said with truth that if literary honours were awarded on the "marks" system—so many for poetry, so many for prose, fiction, essay, drama, and so forth—and the scorer of the highest aggregate to obtain the highest place, the author of those picturesque romances which reminded their admirers of Scott, of those novels of humour and reflection which were such dexterous imitations of Sterne, and of those plays which, with all their defects, still keep the stage, would be easily first. But remarkable as is their technical excellence, there is a lack of the genuine ring of genius about all of them: and all but one or two of them have now their portion, like all other works of mere talent, however brilliant, among the snows of yester-year.

WILLIAM HARRISON AINSWORTH, BY DANIEL MACLISE, R.A.
("*Fraser's Magazine*," 1834.)

Marryat.

One special department of romantic fiction remains to be noticed, in recognition of the singular power and still surviving popularity of the writer who stands at the head of it, though he had few or no notable followers in his own days, and has not had many in ours. Frederick Marryat (1792–1848) was not in his first youth when he began to write, but it may be said that the

whole of his previous life from early boyhood had been passed in accumulating the materials for his fiction. He retired from active service in the Navy about 1830, having then already produced at least one, and perhaps having written more than one, of the nautical novels which, or rather the subsequent additions to their number, gained him a popularity which he still retains. His skill in construction is not great, and his style wavers, like the legs of the recently landed traveller, whenever he quits the sea for the shore. But when afloat its breezy vigour and directness serve his purpose admirably. His descriptions of storm and battle are full of life and movement; his naval characters are drawn with a convincing reality of touch: and his humour is not less rich and broad, while it is infinitely more good-natured, than that of Smollett. A writer with many of the qualities of Marryat, though also with others, which apparently only advancing years developed, was Charles Lever (1806–72). His stories of Irish life, and of military adventures, during the period of the Great War, are as full of boisterous fun as Marryat's, and not inferior to his in spirited draughtsmanship. Lever, however, was too rapid and reckless a writer in his early days to have escaped publishing a good deal of inferior matter, and perhaps the full measure of his gifts was not displayed till near the close of his life, when, adopting an entirely new style to suit the changed taste of the public, he produced two or three novels abounding in quiet humour and in penetrative studies of life and character.

EDWARD BULWER, LORD LYTTON,
BY DANIEL MACLISE, R.A.
("*Fraser's Magazine*," 1832.)

Disraeli: The Political Novel.

One more novelist of unequal performance in many respects, but as fertile of imagination as he was of political resource, and with a literary touch as brilliant as his political genius, remains to be noticed in Benjamin Disraeli, Earl of Beaconsfield (1804–81). The first work which brought him into notice was one of remarkable cleverness and promise, but flimsy in construction, flashy in style, and altogether demanding too much indulgence for the vanity and impertinence of youth. Nevertheless it received at the time what it demanded, and the success of "Vivian Grey" was repeated in a series of romances published by their author in the course of the 'thirties. But it was not till after his return to Parliament in 1837, and his entrance therewith not only into public life but into the best and most authoritative political society, that he can be said to have "found himself" as a novelist. For it was then that he made that unique and fascinating addition to the literature of English fiction—the political novel, a form which has never since been attempted with more than partial success, but which in his hands became not only a vehicle for pungent social satire, interspersed with acute and often profound reflections upon history and politics, but also a complete and invaluable record of the political issues and situations of the author's day.

CAPTAIN FREDERICK MARRYAT.
(*From a drawing by D'Orsay.*)

REGINALD HUGHES. The Developments of Painting.

THE artists who reached the maturity of their powers in the later years before the Pre-Raphaelite revival were not, on the whole, men of great distinction. The eldest and most accomplished of these was Sir Charles Eastlake, a man of fine culture, elected

Academician in 1830, and President of the Royal Academy twenty years later. He served the cause of art somewhat poorly as a painter, but quite admirably as a historian and critic. Something of the same sort may be said of William Dyce, chiefly remembered as a fresco painter, whose somewhat severe manner is not without traces of that study of the great Italian masters to which his youth was devoted. The best of his life was spent in forwarding the cause of the school of design, which, established in the first years of Queen Victoria's reign, has had a remarkable development in our own day. A better remembered name is that of the Irishman Daniel Maclise, who, in his day —which may be fixed about 1840, when he was elected an Academician— had a prodigious vogue. He painted frescoes, huge dramatic pieces, portraits, genre, everything. His talent may be fairly gauged by his famous picture of "The Play Scene in *Hamlet*," combining vigorous composition with extreme staginess, while the texture is wooden and the colour unattractive.

Eastlake; Dyce; Maclise.

BENJAMIN DISRAELI, BY DANIEL MACLISE, R.A.
("*Fraser's Magazine*," 1833.)

Neither was portrait painting at this period in a much more promising condition. Its principal practitioners were Pickersgill, Grant, Macnee, and Boxall—none of them, except perhaps Boxall, artists of any originality. Genre was better served by Thomas Webster, on whom, though a poor colourist, the mantle of Wilkie to some extent fell. The English schoolboy, particularly the village schoolboy, has never been delineated with more spirit or more humour. He was a prolific painter, too; many of his

Webster.

pictures—such as "The Smile" and "The Frown," "The Boy with Many Friends" and "A Village Choir"—retain to the present day a well-deserved popularity.

Sir Edwin Landseer.

In two departments, however, an advance can be noted in this period. The painting of animals and the painting of the sea vastly improved. This was due mainly to two men, Edwin Landseer and Clarkson Stanfield. The former of these came of a family of artists; his father and brother were engravers, while another brother, Charles, was a painter of genre subjects. He was not only a passionate lover and observer of animals, but a scientific student of their anatomy. His observation of character was, indeed, neither profound nor intense, but it was thoroughly sympathetic, and he noted movement and gesture admirably. "The Shepherd's Chief Mourner"—the faithful collie pressing lovingly against the dead master's coffin—perhaps his most famous work, has been described by Mr. Ruskin as one of the most perfect poems which modern times have seen. He was a master of texture, too, and only the unfortunate defect in his feeling for colour prevented him from being a great artist. He is never better seen than in chalk studies of animals in motion. Translated into the black and white of engraving, his pictures have had, and will probably always have, an amazing success. His career was long. He was an exhibitor at the Royal Academy as early as 1817, when he was only fifteen, and his best work was done prior to a severe illness in 1851. He was elected an R.A. as early as 1831, and in 1850 he was knighted. He worked for twenty years and more after this, but these productions (which include the lions in Trafalgar Square) belong to a later period.

Stanfield.

Clarkson Stanfield arrived at distinction a few years later than Landseer. An older man by nine years, he was not elected an Academician till 1835. He was a scene-painter by profession, and did not quit that *métier* until 1829. He has been termed the first purely marine painter that England produced, and this in substance is a correct appreciation. Of course, there had been earlier English painters of the sea. There had been several painters of sea-fights, and of what one may call marine genre. The splendour or terror of the sea enters into more than one of Turner's masterpieces. But in Clarkson Stanfield the sea is the predominant partner, and his pictures exist for its sake. His

A VILLAGE CHOIR, BY THOMAS WEBSTER, R.A.
*(Victoria and Albert Museum.)*

knowledge of it was profound, and had been gained in the severe school of experience, when, as a boy, he had shipped before the mast. One work of Stanfield's alone (we quote from "Modern Painters") presents us "with as much conscientious knowledge of sea and sky as, diluted, would have lasted any of the old masters his life." He drew the sea, too, as a figure-painter draws

ENTRANCE TO THE ZUYDER ZEE, TEXEL ISLAND, BY CLARKSON STANFIELD, R.A.
(*National Gallery.*)

a model, with complete confidence in the sufficiency of its beauty; and though somewhat commonplace in feeling, missing its glories of colour, its mystery and awe, he is never trivial or extravagant.

REGINALD HUGHES. Architecture, 1815-1840.

In the first quarter of the eighteenth century, architecture, as a living art, had been laid to rest in the grave of Wren. About the beginning of the nineteenth century it seemed to show signs of awakening; but its awakening, after a sleep of three generations, resembled that of a hypnotised subject, acting

PEACE.

WAR.

*(From the paintings by Sir Edwin Landseer, P.R.A., in the National Gallery.)*

first on the suggestion of a Greek, afterwards on that of a Gothic, builder. The note of both movements was reproduction or mimicry rather than application or development, and both owed a good deal to literature. The learned publication of Dawkins and Wood had, as far back as 1750, drawn attention to the glorious ruins of Palmyra, and Adam, some ten years later, had made known to his countrymen the imposing remains of Diocletian at Spalato. A similar work in serial form, dealing with the architectural wonders of Greece, published under the auspices of the Society of Dilettanti (Vol. IV., p. 381) had also a considerable vogue, so that when, in 1803, the arrival of the Elgin Marbles (p. 666) showed a tangible Greece to English people, it was not unnatural that there should have been an explosion of something like enthusiasm. To reproduce a Greek or even a Roman building, or part of a Greek or Roman building, on every possible opportunity, was recognised as the chief, if not the whole, duty of the architect. But as the necessities of life in our dark and rainy climate did not usually permit the carrying out of whole buildings in the Greek manner, these expensive adjuncts remained adjuncts, with no relation, or at any rate no intimate relation, with the rest of the edifice. Men like Nash and Smirke and Wilkins, preceded a few years only by Soane and Wyatt, and followed a few years later by Tite and Burton and Basevi, worked in this faith, and what they constructed remains with us to this day. Such are the Bank of England, by Soane; London University and the National Gallery, by Wilkins; the British Museum, by Smirke; the Royal Exchange, by Tite; and the Fitzwilliam Museum at Cambridge—one of the last and best of the series—by Basevi.

The Classical Revival.

Not many neo-Pagan churches were built in the earlier time of the revival, and perhaps it is fortunate. Of such, St. Pancras, London, by Inwood, finished in 1822, is the typical example. Everything there is copied, yet the architect was not content simply to copy. Having transplanted his magnified Erechtheum to Euston Square, he placed above the tall Ionic portico a two-storied Temple of the Winds. With what aim is uncertain; but the effect is unfortunate. The little temple, while crushing the portico and distracting the eye from the imposing lines of the mass underneath, is in fact perched up so high that its real elegance of form cannot be discovered. So, too, the rich flanking

caryatid porticoes, handsome in themselves, are failures as they are placed, coming as a surprise at the end of a long bare wall. The church is not worth mentioning except for this, that it

ST. PANCRAS CHURCH.

shows that our classical copyists could not copy. Probably the best building of the class in England is St. George's Hall at Liverpool, built by Elmes early in the 'forties, and finished, as to the interior, by Cockerell, the tasteful designer of the Taylor Institute at Oxford. The dimensions of the building, 420 ft. by 140 ft., are exceptionally noble, nor less exceptional is the consistency and simplicity of the colonnade and the general beauty of the detail.

The Gothic Revival.

But if successful copying of Greek temples was shown to be to some extent possible to the classic architect, to the Gothic architect the copying of Gothic churches was not only possible but easy. Original and copy belonged to the same country, the same climate, the same religion. Transmutation was not required, only translation. Oddly enough, however, it was for lay purposes that the neo-Gothic style earliest commanded popularity. James Wyatt spent something like a quarter of a century and a quarter of a million of money in building a sham Gothic abbey for the author of "Vathek." It was hailed as a discovery, and, in Fergusson's often-quoted phrase, "nothing was thought of or built but Gothic castles, Gothic abbeys, Gothic villas, and Gothic pigsties." The public mind had to some extent been prepared for this by the works of Britton and Rickman, the latter of whom was the veritable founder of a school of archæology. Finally the younger Pugin, a man of genius both as architect and writer, started something like a crusade in favour of the purer forms that prevailed prior to the Reformation. In the dearth of a living style of architecture, the fiery advocate of the past triumphed on every side, and his Catholic churches (for in his hatred of Protestant architecture he cast off the Protestant religion) became models for imitation. Two great advantages the Gothic architect certainly had over his classical brother. He worked in the most adaptable instead of the most intractable of styles. Windows, finials, buttresses, panels, brackets, mouldings, models of every form and for every purpose, were to be found in England by any industrious seeker. It was cheap too; for, if the outlines and traceries are correctly copied, a good general effect can be obtained with quite worthless details. All this made the new Gothic popular with the intelligent architect and the intelligent laity, while the tendency of the old Catholic form of architecture to enhance the priest's ceremonial importance helped to make it popular with the intelligent clergy.

The Houses of Parliament.

The great era of church restoration and extension was, however, not yet. Before it came, chance decided that the greatest lay building of the century, the Parliament House at Westminster, should also be Gothic. The old buildings were destroyed by fire in 1834, and Parliament determined that its new abode should be of the style in vogue. The new building

was begun in 1840, the architect being Sir Charles Barry, the builder of that imitation of the Farnese Palace known as the Reform Club-house. He was, in fact, a student rather of the Renaissance than of the times of the Plantagenets, and as a result his general design is classical in feeling, while the details are Gothic. It is a building full of defects: the Victoria Tower is too big; throughout there is want of accent; the ornament

FONTHILL ABBEY IN 1823.
*(Drawn and engraved by T. Higham.)*

is largely ineffectual, and one feels that, after all, the whole thing is modern to the core. But the grandeur arising from size—the mass covering eight acres—the stately length of the terrace (exceeding 990 ft.), and the real elegance of the central tower, make it, all said and done, a very imposing edifice, perhaps "the most successful attempt of the century to apply medieval architecture to modern life."

A. M. CLERKE. Astronomy, 1815-1846.

English astronomy was, in 1815, passing through a stage of temporary decline. The great career of the elder Herschel (1738–1822) had virtually closed; that of the younger Herschel (1792–1871) had not yet opened. The excise duty on glass

barred the way to improvements in refracting telescopes; and competition seemed hopeless with the giant mirrors lying disused at Slough. The promise of better things was not, however, absent. Stephen Groombridge (1755–1832), a retired linendraper, had nearly completed the 50,000 observations from which his "Catalogue of Circumpolar Stars" was constructed; one of Troughton's grand circles replaced at Greenwich, in 1812, Bradley's superannuated quadrant: and mathematical analysis, under the motive power supplied by the enthusiasm of Herschel, Babbage, and Peacock, was rapidly making its way at Cambridge. A general revival was marked by the foundation, in 1820, of the Astronomical Society of London, designed by Dr. William Pearson (1767–1847), and powerfully promoted by the indefatigable Francis Baily (1774–1844), who did more than any man to render astronomy cosmopolitan by reducing British and foreign practical methods to uniformity.

The Revival.

John Pond (1767–1836) was meantime labouring to re-create official astronomy. He succeeded Dr. Nevil Maskelyne as Astronomer Royal in 1811, and attained a degree of precision in the determination of star-places that has scarcely yet been surpassed. His prolonged controversy with Dr. Brinkley (1763–1835), Astronomer Royal for Ireland, regarding certain alleged star-parallaxes, in which he took the negative, and, as it has proved, the right side, strongly stimulated improvement; and Bessel's saying, that the *ne plus ultra* of modern refinements was reached in his later catalogues, has been justified by Dr. Chandler's disengagement from his "double-altitude" observations, not only of a minute periodical variation of latitude, but of its epicyclical character.

Sir George Airy's (1801–92) energetic administration at Greenwich lasted forty-six years—from 1835 to 1881. It was marked by a great widening in the scope of the inquiries pursued. New departments of activity—magnetic, meteorological, and spectroscopic—were created; the study of the constitution of the heavenly bodies was associated with that of their movements; and the step was definitively taken of lifting our national astronomy to a higher plane than that of mere practical utility.

During the first third of the century the southern hemisphere was, so to speak, annexed. Observatories were erected

*Photo: York & Son, Notting Hill, W*

THE HOUSES OF PARLIAMENT.

Observations in the Southern Hemisphere.

by the East India Company at Bombay, Madras, and St. Helena; and by Sir Thomas Brisbane at Paramatta, New South Wales, where, on June 2nd, 1822, Encke's comet, then invisible in Europe, was detected on its first calculated return to the sun. Above all, the equipment at the Cape of Good Hope of a royal observatory corresponding to the Greenwich establishment, was accomplished in 1829, the grandiose idea of universal dominion over the skies being thus realised as a simple consequence of England's world-wide mercantile and colonising energy. Fearon Fallows (1789–1831), the son of a poor weaver at Cockermouth, was the first Cape astronomer. He died July 25th, 1831, the victim of accumulated misfortunes and mishaps, and was succeeded by Thomas Henderson (1798–1844), subsequently Astronomer Royal for Scotland. During his one year's exile he worked with incredible diligence; and his discussion at home of the collected data brought to light, for the splendid binary star *a* Centauri, an annual parallax of one second of arc, implying a distance of close upon twenty billions of miles. This was the earliest authentic result of the kind obtained, although its announcement, January 3rd, 1839, was slightly anticipated by Bessel's regarding 61 Cygni.

SIR GEORGE BIDDLE AIRY.

(*From "The Royal Observatory, Greenwich," by E. W. Maunder, Religious Tract Society.*)

Geodesy.

Sir Thomas Maclear (1794–1879) came third on the list of royal astronomers at the Cape, and his re-measurement of Lacaille's arc of the meridian was one of the most important geodetical operations of the century. In this direction England took the lead of other nations by the trigonometrical surveys of India, England, and South Africa, usefully supplemented by the

pendulum-swinging experiments conducted in various parts of the globe by Sabine, Foster, and Kater. These investigations of the earth's figure may be associated with Baily's elaborate determination of its mean density. Adopting and improving Cavendish's method of 1798, he arrived in 1842 at the nearly exact conclusion that our globe weighs 5·66 times more than if composed throughout of water.

Sidereal science made a fresh start when John Herschel and

ROYAL OBSERVATORY, CAPE TOWN.

*(From a photograph supplied by H. M. Astronomer.)*

James South combined, in 1821, to re-measure Sir William Herschel's double stars. Within two years 380 pairs had been tested for orbital motion, in many cases unmistakable; then the colleagues separated, South carrying on the work at Passy, and Herschel at Slough. By 1833 the latter had discovered 3,347 new stellar couples, and his sweeps at the Cape in 1834–8 yielded an additional harvest of 1,200. During many ensuing years, however, the subject received little attention in this country, except from Admiral W. H. Smyth (1788–1865) and William Rutter Dawes (1799–1868), perhaps because it had been

**Double Stars.**

**Sir John Herschel's Work.**

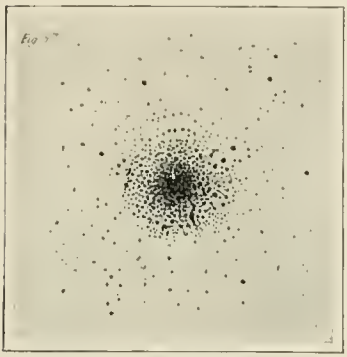
virtually appropriated in Russia by Wilhelm and Otto Struve. Double stars are indeed observed mainly that their mutual orbits may be computed; and this, because of the extreme smallness to which their orbits are reduced by distance, is a very delicate matter. It was immensely facilitated by Sir John Herschel's invention, described before the Royal Astronomical Society, January 13th, 1831, of a graphical method by which rigid numerical data are moulded into harmony by the aid of the eye and hand, guided by the instinctive judgment of common sense. This made the practical beginning of stellar gravitational astronomy.

His "review" of the northern heavens was executed at Slough during the years 1825–33 with a twenty-foot reflector of his own construction. Its leading object was to call over the roll of his father's nebulæ, a large number of which could be seen with no other instrument then existing, so that their identification devolved upon him as a scientific duty, no less than by inheritance. The outcome of his labours was a catalogue of 2,307 nebulæ, 525 of them previously unrecorded. Accompanied by a number of beautiful and characteristic drawings, it was published in the "Philosophical Transactions" for 1833. Stimulated by success, and conscious of unexhausted powers, he determined to round off to completion his "Survey of the Nebulous Heavens," and embarked for the Cape with his family and instruments, November 13th, 1833. His stay of four years at Feldhausen made an epoch in southern astronomy. He discovered and catalogued 1,700 nebulæ, his monographs of several of these wonderful objects representing, in themselves, a formidable expenditure of toil; and his extensive, though not exhaustive, lists of the nebular and stellar contents of the Magellanic Clouds still remain the sole authority upon the subject. He, moreover, extended his father's experiments on the construction of the heavens by counting 70,000 stars in 2,300 gauge-fields; established stellar photometry on a firm basis; and by his description of the threefold increase in the light of $\eta$ Argûs, December 16th, 1837, drew attention to that star's abnormal character. His observations of the varying aspects of Halley's comet between October, 1835, and May, 1836, are of permanent interest; and his study of the development of sun-spots at the maximum of 1837 led him to originate the cyclonic theory of

their origin. The detailed results of this brilliant expedition were collected in a finely illustrated quarto volume published in 1847.

"Baily's Beads."

"Baily's Beads" were first expressly noticed by Francis Baily during an annular eclipse of the sun on May 15th, 1836. The phenomenon consists in the breaking up into lucid points of the narrow solar crescent left by the moon's advance, and is caused primarily by the serrated nature of the moon's limb. Effects of irradiation and bad definition then combined to complicate appearances which optical improvements have since reduced to comparative insignificance. Baily's vividly expressed wonder at them may be said to have maugurated the era of eclipse-expeditions; and he himself repaired to Pavia for the purpose of observing the totality of July 8th, 1842, during which the corona and prominences displayed themselves with such startling splendour as to raise the problem of their nature to the very first rank among those presented, at that time, to students of the sun.



DRAWING OF NEBULA BY SIR J HERSCHEL

DRAWING OF NEBULA BY SIR J. HERSCHEL.
("*Philosophical Transactions*," Royal Society, 1833.)

Very early in its known career the new planet Uranus (discovered by William Herschel in 1781) began to give trouble

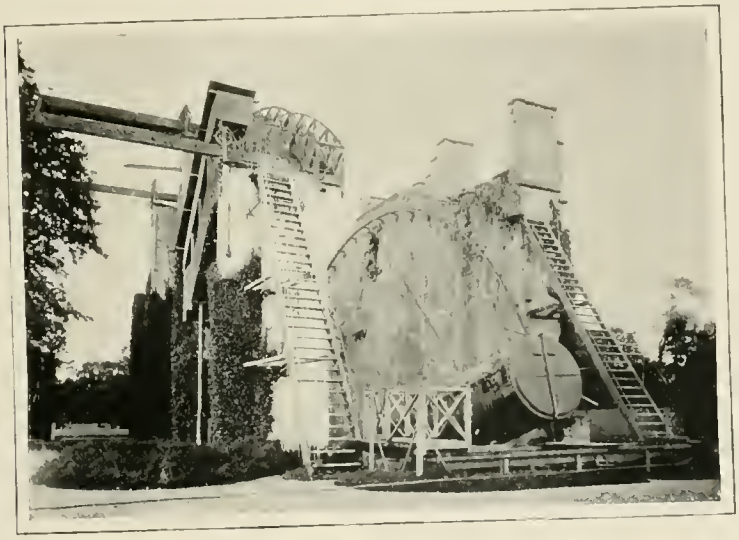
The Planet Neptune.

to computers of its orbit. It was hoped that Bouvard's Tables, published in 1821, would set things straight, but evidence of continued recalcitrance was quickly forthcoming. The idea, accordingly, that these persistent irregularities were due to disturbance by an exterior body, formed itself in a few sagacious minds; and the Rev. T. J. Hussey even contemplated, in 1834, the possibility of assigning the position, at a given epoch, of the hypothetical planet. This arduous task was, indeed, far beyond his powers: but in 1841 John Couch Adams (1819–92), then an undergraduate of St. John's College, Cambridge, laid his plans for grappling with it. No sooner, in fact, had he taken his degree as Senior Wrangler than he proceeded to carry them into execution: and on October 21st, 1845, he deposited at the Royal Observatory a paper containing a complete explanation of Uranus's untoward behaviour through the gravitational action of a body soon afterwards known as "Neptune." The "inverse problem of perturbations" thus received its first solution. Although Adams gave the orbital elements and place in the sky—exact, as it proved, to within about three lunar diameters—of the disturbing body, it was not until Leverrier had announced a similar conclusion that a search was, by Airy's request, instituted for it by Professor Challis at Cambridge. And the pursuit was conducted in so leisurely a fashion that the planet, observed on August 4th and 12th, 1846, remained unrecognised pending the comparisons by which alone, in the absence of a comprehensive star-map, it could be sifted out from the multitude of surrounding stars; so that the prize of its visual discovery, on September 23rd, fell to Galle of Berlin, acting on Leverrier's instructions. In justification of Airy's indifference, it should be added that an inquiry addressed by him to Adams, early in the proceedings, regarding an essential point in his theory, was unaccountably left unanswered. The attendant satellite of Neptune was detected, October 10th, 1846, by William Lassell (1799–1880), at Starfield, near Liverpool. He used a reflector two feet in aperture, of exquisite definition, made and equatorially mounted by himself.

The construction of this class of telescope has, from Newton's time until now, been left mainly to British artists and amateurs. The giant speculum finished by the third Earl of Rosse (1800–67), in February, 1845, has since been surpassed in light-power,

but not in size. The reason of this apparent anomaly is that the metal composing it is considerably less reflective than silvered glass, the material of modern reflectors; hence Dr. Common's five-foot gives brighter images than the Parsonstown six-foot mirror. The latter was especially effective in the resolution—occasionally fallacious—of nebulæ into stars: and the

Nebulæ.



THE GREAT TELESCOPE, BIRR CASTLE, IRELAND.

(*By permission of the Right Hon. the Earl of Rosse.*)

opinion gained ground that the process could be indefinitely extended with the indefinite extension of telescopic vision. Herschel's theory of the development of nebulæ into stars sank, accordingly, into discredit; the distinction between nebulæ and clusters was regarded as a mere effect of distance; and thought ranged amid an archipelago of "island-universes" almost infinitely beyond the bounds of the Milky Way.

The discovery, with the great reflector, of spiral nebulæ proved of more permanent importance. This remarkable type of structure first disclosed itself, in April, 1845, in the well-known shining vortex situated near the tail of the Great Bear: its prevalence was soon attested by further examples, and has been amply confirmed by photographic inquisitions. The

workings of a fundamental law of sidereal growth and change are thus clearly illustrated to our sight, though very dimly, as yet, to our apprehension.

W. G. RHODES. Physics, 1800-1846.

To give a detailed account of the progress of the science of physics during the nineteenth century would demand a volume in itself; the rate at which Nature's laws have been unfolded by philosophers, some now passed away, some still living, has been so great that a comparison of the condition of science at the beginning of the century with the scientific knowledge of to-day, together with its many and extensive applications for the benefit of the public, show that the hobby of the few in 1800 has now become the occupation of the many.

Electrical Science: Volta.

Until the year 1800 our knowledge of electricity was purely statical: that is, the only sources of electricity then known were friction machines of various kinds, induction machines of the electrophorus type, and atmospheric disturbances. The discovery of the electric pile by Volta in the year 1800 furnished a source from which a continuous supply of electricity could be obtained. Volta's pile was quickly followed by his cell, which consists of a cup or cell of acidulated water into which dip side by side a piece of zinc and a piece of copper. This arrangement causes an "electromotive force" to be set up, so that when the copper and zinc are connected by a wire an electric current is sent from copper to zinc through the wire, and from zinc to copper through the liquid. The effects produced by the passage of electricity through bodies could now be more easily observed. It was already known that an electric discharge produced destructive effects on passing through a body. Lightning conductors had been introduced by Franklin to protect buildings and life from the terrible consequences which had sometimes been observed during thunderstorms. Buildings had been burnt, and people and animals killed and their bodies sometimes charred by a lightning flash, or a thunderbolt, but the discharge was so instantaneous that there was not time to study the nature of the process. Volta's cell, however, furnished a means of producing a continuous supply of electricity. The spirit of investigation was aroused, and every physicist directed his energies to find out, if possible, the nature

of electricity, and to investigate its effects upon various forms of matter.

Sir Humphry Davy.

Davy (p. 86), the director of the chemical laboratories at the Royal Institution in Albemarle Street, which Count Rumford had founded in 1800, was one of the first in England to profit by Volta's discovery. He applied the electric current to decompose, by the process called electrolysis, various chemical compounds, and also by this means discovered that some substances, previously thought to be elements, were in reality chemical compounds. In this way Davy discovered in 1807 the five metals—potassium, sodium, barium, strontium, and calcium. Davy's electrolytic researches were only qualitative; that is, he observed the nature but not the amount of the electrolytic actions. It was left to the illustrious Faraday, his assistant and subsequent successor, to determine the quantitative laws which govern the decomposition of substances by electrolysis.

The Voltaic Arc.

To Davy is also due the discovery of the voltaic arc. He found that if the two wires coming from the terminals of a voltaic battery are brought together and then parted, a spark will show itself as they part: the spark he found to be brighter if dense charcoal points were used to take the spark. The discovery was made, but, owing to the difficulty of obtaining a sufficiently large electric current, was not developed until the production of the voltaic arc was rendered easier by the invention of dynamo-electric machines. In the autumn of 1815 Davy invented the miners' safety lamp which bears his name. Almost simultaneously, and quite independently, George Stephenson the engineer (p. 273) invented a safety lamp identical in principle with Davy's, but somewhat different in detail. Both depend on the principle that a white heat is necessary to ignite the inflammable gases which are found in coal mines; so that flame cannot pass through narrow metallic passages if the metal is kept below a certain temperature.

Davy was not a scientific recluse. He lived at a time when a man of his calibre was much sought after. His position at the Royal Institution brought him into contact with the leading men of the day. Fascinating as a man, enthusiastic as a lecturer, and gifted with a ready flow of language, he contributed to the advancement of science as much by attracting large and influential audiences to his lectures as by his valuable

researches. For his services he was created a baronet. He died in 1829, at the early age of fifty-one.

Thomas Young.

A contemporary of Davy's, though a man of entirely different type, was Thomas Young, who for two years occupied the chair of Natural Philosophy at the Royal Institution. Educated at the Hunterian School of Anatomy and St. Bartholomew's Hospital, and afterwards at Göttingen, he became qualified as a medical practitioner in 1796. He had already been elected a Fellow of the Royal Society for a treatise on the eye. He entered Emmanuel College, Cambridge, in 1797, and did not commence to practise as a physician until the year 1800. In 1801 he accepted the chair of Natural Philosophy at the Royal Institution, but resigned after holding it for two years in order to devote himself to the medical profession.

Theories of Light.

Prior to Young's time there were two theories of light, Newton's *corpuscular* theory and Huyghens's *wave* theory. No crucial test or experiment had been devised to decide in favour of either. Sound was known to travel by means of longitudinal aërial undulations. Young discovered that two sound-waves could destructively interfere and produce the phenomenon of *beats*. His greatest work was the application of the principle of interference to light. Placing a source of light behind a disc of cardboard punctured with two small pin-holes very near together, he observed a series of light and dark bands on a white screen placed near the disc on the opposite side from the source of light. The light proceeding from the two pin-holes had produced interference phenomena, and the wave theory was justified. The wave theory was not satisfactorily completed, however, until Fresnel (1788–1827) in Paris shortly afterwards theoretically explained the interference phenomena by supposing that luminous vibrations take place in an all-pervading æther, and *in a direction at right angles to the direction of propagation of the light*. Fresnel still further justified the wave theory by applying it to explain the phenomenon of polarisation of light discovered by Malus at the beginning of the century.

As Foreign Secretary to the Royal Society, Young forwarded to Fresnel the Rumford medal for his researches on light. Fresnel died a few days afterwards, at the age of thirty-nine.

Amongst Young's contributions to physical science must also be reckoned his researches on elasticity. He was a remarkable

man in many ways, and up to his day ranked second only to Newton as a natural philosopher. He was proficient in chemistry, physics, medical science, mechanism, and was more or less familiar with fourteen languages. He was also an authority on Egyptian hieroglyphics. He died in 1829, three weeks before Davy.

**Electricity and Magnetism.**

At the beginning of the century it was known from Coulomb's researches that two magnetic poles acted upon each

THOMAS YOUNG, BY H. P. BRIGGS, R.A.
(*By permission of the Royal Society.*)

other with a force directly proportional to the product of their strengths, and inversely proportional to the square of the distance between them; and the same law was known to hold good for the force exerted by two quantities of electricity upon each other. This led many scientists to seek for relationships between magnetism and electricity.

**Oersted.**

The first to bring to light a connecting link was Hans Christian Oersted, of Copenhagen. Often had he tried and as often failed. During the winter 1819-20 the discovery was made in the presence of a class of students. While lecturing he suddenly thought of a new mode of attacking the problem. Taking a wire joining the poles of a battery, he placed it parallel to and above a compass needle. Instantly the needle was

deflected from its position, and the discovery was made that a force exists between an electric current and a magnet. He also found that on reversing the direction of the current the needle was deflected in the opposite way. The discovery was published in the summer of the year 1820. In recognition of his work the Royal Society awarded to Oersted the Copley Medal in 1820.

Oersted's discovery marks the birth of the subject of electromagnetism. The beginning was made, and the subsequent rapid development speaks volumes for the scientific intellect of the period.

Ampère.

On September 11th, 1820, André Marie Ampère, Professor of Mathematics at the Ecole Polytechnique, Paris, first heard of Oersted's discovery. Immediately setting to work, he repeated Oersted's experiment and devised and successfully performed many others. On the 18th of the same month he announced the fundamental principles of electromagnetism. In one week he had worked at the subject both experimentally and theoretically: he discovered that a pivoted wire spiral carrying an electric current behaved like a magnet and set itself in the magnetic meridian: he investigated the action of currents on currents, predicting theoretically and verifying experimentally that two parallel electric currents attract each other when they flow in the same direction, and repel each other when they flow in opposite directions; also that two currents not parallel attract each other if they both converge to or both diverge from the apex of the angle formed by their directions, while they repel each other if one of the currents approaches the apex of the angle and the other recedes from it.

Ampère was the first to use the action of currents on magnets as the principle on which to construct a galvanometer, or current detector and measurer. In order to increase the deflection of the needle by the current, he bent the wire carrying the current into the form of a rectangle and pivoted the compass needle in the centre. Shortly afterwards Schweigger improved Ampère's arrangement by winding many turns of wire into a rectangular form. This improvement rendered the instrument much more sensitive.

In 1820 Arago in France and Davy in England discovered independently that steel wire was magnetised on placing it

inside a helix of wire carrying a current. Thus an electric current was shown not only to influence a magnet, but also to be capable of producing magnetism. This fact led Ampère to form a theory of magnetism. He supposed that every molecule of a magnet was itself a magnet, and that the molecules owed their polarity to electric currents circulating round them. This was the first attempt to explain the properties of a magnet by reference to its individual molecules. The idea of molecular currents has, however, since been shown to be unnecessary for the complete explanation of magnetic phenomena.

Not long after the discovery that an electric current is capable of magnetising a piece of steel, Sturgeon in England produced an electromagnet. He found that by using soft iron instead of steel a given current would produce much more intense magnetisation, though the effect ceased when the current was stopped. He varnished the iron, bent it into the shape of a horseshoe, and wound coils of naked wire in a spiral round it. **Sturgeon.**

Although the theory of electromagnetism was so well developed, the laws governing the flow of an electric current along a conducting wire were not understood. In the year 1825, Ohm, afterwards Professor of Physics at Munich, published his famous law. He showed that the intensity of an electric current depends not only on the battery power, or "electromotive force" as it is called, but also upon the nature of the conducting wires. Different wires of the same length and thickness offered different resistance to the passage of the current. This resistance Ohm found to be an intrinsic property of the conducting wire itself. Ohm's law as it is now expressed states that the ratio of the electromotive force driving the current through a conducting wire to the current itself is constant. This ratio is defined to be the resistance of the conducting wire. **Ohm.**

Although Ohm's discovery was of fundamental importance, it was received with doubt and scepticism by most scientists, and rejected altogether by many. The law was first recognised by the Royal Society of London in 1841, sixteen years after its publication in Poggendorff's "Annalen." In recognition of its merits Ohm was awarded the Copley Medal. Ohm subsequently published his theory of the siren. He died in July, 1854.

A new mode of generating an electric current was discovered in 1821 by Professor Seebeck of Berlin. He found that, if two

Seebeck and Becquerel.

wires of different metals were joined together to form a closed circuit and their junctions brought to different temperatures, an electric current flowed round the circuit. Becquerel, experimenting later on various metals, formed a series of metals placed in such an order that the current set up at the heated junction of any two goes from the metal which follows to that which precedes in the series. In later years the subject has been greatly advanced by Professor P. G. Tait, of Edinburgh University.

Faraday.

Foremost among experimentalists was Michael Faraday (p. 86), who became Davy's assistant at the Royal Institution in 1813. Having charge of the laboratories he had opportunities for conducting researches, first under Davy's guidance, and afterwards on his own account. He commenced his brilliant researches in electricity in the year 1821, when he re-discovered Oersted's experiment. This was followed by his discovery that a magnet will rotate round a wire carrying an electric current, and that a wire carrying a current will rotate round a magnet. The idea for this experiment Faraday got from Dr. Wollaston (Vol. V., p. 752), who had unsuccessfully tried to do the same experiment himself in Davy's laboratory. Where Wollaston failed Faraday succeeded, and obtained the first continuous motion electromagnetically.

In 1823 Faraday published his work on the liquefaction of gases. In the following year he was elected a Fellow of the Royal Society, and in 1825 he was appointed director of the laboratories at the Royal Institution.

In 1831 Faraday commenced a series of some of the greatest discoveries of the present century. In 1825 Arago had performed an experiment which puzzled the physicists of the day. On rotating a disc of copper underneath a compass needle suspended horizontally, the needle was observed first to deflect in the direction of the motion of the disc and then to rotate itself, but always at a speed slower than that of the disc. No one had explained why it was that the compass needle rotated. Faraday thought that the rotation was due to induced electricity in the disc, but, although he repeatedly attempted to show experimentally that this was the reason, he did not succeed until August, 1831. He knew that magnetism could be produced by electricity, and he set himself to discover

**Electro-Magnetic Induction.**

whether electricity could be produced from magnetism. He took an iron ring and wound two spirals of wire on it: sending an electric current round one spiral to magnetise the ring, he looked for an electric current in the other. The first spiral was connected with a battery and the second with a galvanometer, but when the current was flowing round the one the galvanometer failed to register any current in the other. At the instant of breaking the battery circuit Faraday observed that the galvanometer needle gave a kick, and again, but in the opposite direction, on making the battery circuit. On breaking or making the battery circuit an instantaneous *induced* current flowed through the galvanometer circuit. He saw that he was now in a position to explain the Arago disc phenomenon; *induced* currents were generated in the copper disc, and the action between these and the needle caused the latter to rotate. To prove this he mounted a copper disc so that it could be rotated between the poles of an electromagnet; he connected the centre of the disc and its edge with a galvanometer, and on rotating the disc the galvanometer needle was deflected, showing the presence of induced currents. This disc of Faraday's is the prototype of the modern dynamo. The importance of the discovery of induced currents may be gathered from the fact that now millions of pounds are annually spent on their production.

**Laws of Electrolysis.**

Between the years 1831–34 Faraday devoted himself to investigating the laws which govern electrolytic action. He stated the results of his researches in his three famous laws, which are as follow:—(1) The electrolytic action of a current is equal at all points round the circuit. (2) the quantity of gas disengaged in a minute is a standard measure of the average strength of the current during that minute, and the total quantity of gas evolved is the measure of the total quantity of electricity that the current has conveyed round the circuit; (3) when the same current acts on many electrolytes the weights of the elements separated by electrolysis are in proportion to the chemical equivalents of these elements.

The discovery of these laws has furnished us with our most accurate method of measuring the strength of an electric current, and all instruments intended for accurate measurement of current are standardised by an electrolytic method.

Electric Induction.

Faraday's next work was the discovery of self-induction, in 1834. He found that on making or breaking an electric circuit an *electromotive force is induced* in the circuit itself. All electromagnetic induction phenomena have been summed up by the Russian physicist Lenz in the statement that "induced currents are always generated in such a direction as tends to oppose the motion that gives rise to them."

During the period 1835–38 Faraday devoted himself to the study of electrostatic induction, and announced his theory of a medium through which electrical attractions and repulsions are transmitted at each point along a certain definite direction. The medium he considered to be in a state of strain, and he pictured it as being filled with what he called "tubes of force." An electric current flowing round a circuit causes the surrounding medium to be in a state of strain, the amount of which he represented by a number of these hypothetical tubes of force; also, induced currents are generated whenever a motion of these tubes relative to a closed metallic circuit takes place. The amount of the induced current he found to depend upon the nature of the surrounding medium. He also showed that the force exerted between two electrostatically charged conductors varies with the separating medium. The separating media, whatever non-conductors of electricity or insulating materials they might be, he named *dielectrics*, and their property on which the amount of electric action depended, *specific inductive* capacity.

Light and Electricity.

The wave theory of light had been placed on a firm basis by the experiments of Young and Fresnel. Malus had shown that light could be polarised, or, as explained by the wave theory, have its vibrations constrained to one plane by the interposition of various crystals or by repeated reflection. Faraday in 1845 found that if such a polarised beam of light is subjected to the action of a magnetic field the plane of polarisation is rotated through an angle whose magnitude depends upon the strength of the magnetic field, and the direction of the rotation is the same as that in which the current flows to which the magnetic field is due. At a subsequent date Verdet found that the amount of rotation can be taken as a measure of the strength of the magnetic field. This result is of great importance in the theory of electricity. Just as Oersted's experiment showed a

relationship between magnetism and electricity, this experiment of Faraday's pointed to a relationship between electromagnetism and light. It was left to Maxwell to reveal the true nature of the relationship.

Another important work of Faraday's was the discovery that some bodies exhibit properties exactly opposite to those possessed by iron when placed in a magnetic field. Whereas a freely

MICHAEL FARADAY, F.R.S., BY THOMAS PHILLIPS, R.A.
(*National Portrait Gallery.*)

suspended piece of iron sets itself in the direction of the field, some bodies similarly suspended take up their position of rest at right angles to the field. Bodies of the iron type, as regards their behaviour under magnetising influences, Faraday called *paramagnetic*, or simply *magnetic* bodies: those belonging to the other class, of which bismuth is the most striking example, he called *diamagnetic* bodies. To this new property of magnetism which he discovered he gave the name *diamagnetism*.

Faraday had been appointed to succeed Davy as Professor of Chemistry at the Royal Institution in 1833. In appreciation of

his brilliant work the queen in 1858 offered him a house on Hampton Court Green, where he lived until his death in August, 1867.

Faraday has justly been called the prince of experimentalists. He presented no fewer than 158 scientific memoirs to the Royal Society. Like many other important scientific truths, his conception of a medium transmitting electrical energy was viewed with scepticism by contemporary scientists. Mathematicians had grown fond of their theory of action at a distance, which did not assume as necessary any medium to act as a vehicle of energy. He was soon, however, to have as an interpreter of his views one of the greatest mathematical physicists of the age—James Clerk Maxwell.

Wheatstone.

Prominent among the physicists of his day was Charles Wheatstone, Professor of Physics at King's College, London. To him is due the first attempt to measure the velocity of transmission of electricity. By means of a revolving mirror he found its rate of propagation to be 288,000 miles a second. The method used has since been applied by Foucault to determine the velocity of light. Wheatstone was also the first to apply the method of spectrum analysis to the determination of the constitution of bodies.

Rowan Hamilton.

The theory of light was materially supplemented by Sir W. R. Hamilton, of Dublin. His investigations in mathematics and mathematical physics have placed him foremost in the ranks of mathematicians. His contributions to physics chiefly related to geometrical optics. The work which may be regarded as his masterpiece is the invention of an entirely new method of mathematical analysis, a non commutative algebra, called by him *Quaternions* (1853). The method is extremely powerful, and particularly adapted to the solution of physical problems.

Joule

In 1837, the year of the invention of the electric telegraph, a young Manchester man, James Prescott Joule, then only nineteen years of age, began to publish his researches on relations between heat and energy. In 1840 he experimentally demonstrated the law that the heating effect of an electric current is directly proportional to the resistance of the circuit through which it flows, and also proportional to the square of the current flowing. In 1843 he presented his *magnum opus* to the Royal

Society. This was a paper "on the caloritic effects of magneto-electricity, and on the mechanical value of heat." In this paper he showed that "an amount of energy equal to 772 foot-pounds will, if communicated to one pound of water, raise its temperature one degree Fahrenheit," in other words, he showed that a definite relation exists between heat and energy, and that a given amount of energy can be converted into a definite quantity of heat.

Joule's earlier papers show that the idea of a mechanical equivalent of heat had for some time occupied his mind, yet, in 1843, his announcement was far from being well received. The leading physicists at first regarded it as the product of a country youth's imagination. The first to appreciate Joule's work was Sir William Thomson, who was six years his junior. Others followed suit, and came to see that the country youth had unfolded to them one of Nature's grandest laws. To Joule, in England, and Von Helmholtz, in Germany, we owe the discovery of the law of "Conservation of Energy," a law which states that energy is in the same degree indestructible and uncreatable as matter.

*Photo. Walker & Cockerell.*

SIR CHARLES WHEATSTONE, F.R.S., BY SAMUEL LAURENCE.

*(National Portrait Gallery.)*

In the light of our present knowledge, Joule's work as a whole, the original of his ideas, the importance and generality of his discoveries, and their effect on the scientific world, place him side by side with Newton in the history of physical science.

ROBERT STEELE. Chemistry.

THE progress of chemistry is the best proof that science has no country. The history of English chemistry cannot be understood without continually referring to the discoveries of other lands. At the time of which we write the atomic theory of Dalton had already been confirmed by Gay-Lussac's discovery and by Avogadro's explanation of it, by the researches of

Dulong and Petit on heat, and by those of Mitscherlich on crystalline form. For the next few years the chief advance in theoretical chemistry lay in the direction of determining the true formulæ for chemical substances, and of making these

JAMES PRESCOTT JOULE, BY ALFRED GILBERT, R.A.

*(By permission of the Corporation of Manchester.)*

formulæ express what is known as to the properties it possesses. Water, as is well known, is expressed to-day by the formula $H_2O$ –a system of notation introduced by Berzelius—in 1832 it was written HO, both these formulæ indicating that in analysis one part of hydrogen is found combined with, or is equivalent in combining power to, eight parts by weight of oxygen. Gerhardt and Laurent, two French chemists, were the first to definitely grasp the distinction between molecular,

atomic, and equivalent weights, and thus to prepare the way for the development of the atomic theory and restore the atomic weights of Berzelius. An English chemist, Thomas Graham (1805–69), gave important aid by his researches. It was at this period (1832) generally agreed that metallic oxides consisted of one atom of oxygen combined with one atom of metal, and that they united with one "atom" of acid to form neutral salts. Graham undertook the study of the phosphoric acids, and demonstrated that the "atom" of acid in these compounds combined with one, two, or three "atoms" of water, replaceable by metallic oxides. Liebig (1803–73) following up this line of argument, was at last able to lay down the definition that acids are compounds in which hydrogen is replaceable by metals —a theory which still, with modifications and additions, holds its ground. An addition to the science was made by Faraday's discovery of the laws of electrolysis (p. 255), which furnished chemists with a ready means of arriving at the chemical equivalents of the elements, and Wöhler's preparation of urea from ammonium cyanide had broken down the imaginary barrier which separated substances prepared in the laboratory from those elaborated by living organisms. The field was thus laid open, and students were not long wanting to cultivate it.

At this time there was in England no place at which a student of chemistry could learn the first principles of scientific investigation. It was not till 1837 that Graham came to London as a Professor in what is now University College; and, unquestionably, all who could do so went to Giessen to the laboratories which Liebig had established there, in imitation of Gay-Lussac. Among the more distinguished of his English students were Playfair, Williamson, and Frankland. It is to Williamson that we owe the next advance in chemical theory. Dumas had laid down a theory of type, in which he asserted that the character of chemical compounds depended on the number and arrangement of the atoms rather than on the nature of these atoms, in opposition to the theory of Berzelius, which regarded every compound as formed of two radicles such as into which it would be divided by electrolysis. Williamson's work on the relations of ether and alcohol to each other and water, and Hofmann's (1818–92) on the substances which he afterwards proved to be derivatives of ammonia, served to erect a theory of types on a

firmer base. At first all compounds were referred to these types, water and ammonia; but later theories have lessened its importance to teaching, and the danger of its over-use.

The British Association for the Advancement of Science, founded in 1834 by a group of scientific men, early attained its reputation as a combination of autumn junketing and serious work; but it never wrought better for English science than when it requested Liebig, in 1837, to draw up a report on the state of knowledge in organic chemistry. The report was not drawn up, but in its place he published "Chemistry in its Application to Agriculture and Physiology" (1840), a work in which the close relation between the nutrition of plants and the chemical composition of the soil and the air is finally established. The effect of that work on English chemical science is incalculable. A universal demand for schools of chemical training was made, and even the older universities opened laboratories. When, in 1842, Liebig visited this country the enthusiasm grew, and English country gentlemen, anxious for analyses of the soil of their farms, vied with enthusiasts for science in subscribing to the Royal College of Chemistry (1845–53).

A CHEMICAL LABORATORY.
("*Book of English Trades*," 1832.)

The popular interest in chemistry led, however, to a more enduring result. A class of students had arisen round Graham capable and desirous of engaging in original work, and in 1841 he founded the Chemical Society, which has been associated since then with every development of the science in this country, and whose journal has been its chief organ, more especially since 1871, from which year it has included full abstracts of all papers appearing in other periodicals devoted

1846]

to the science. The last survivor of the original members, Lord Playfair, was Graham's pupil at Glasgow. An earlier but abortive attempt had been made to found a Chemical Society in 1832.

Liebig, on his return from England, summed up the situation by saying that the fault of Englishmen was to look exclusively

THOMAS GRAHAM, BY G. F. WATTS, R.A.
*(By permission of the Royal Society.)*

to practical results, and this weakness led to the fall of the first and greatest school of chemistry we have had in this country. The post of Professor was offered to Hofmann, one of the most brilliant of Liebig's pupils, and, on his acceptance, he at once set to work. The list of his students includes many of the best-known names of the day, and their work at once began to appear in the Journal of the Chemical Society: but it is curious to read in the reports of the college Hofmann's apologies for working on such useless substances as aniline, etc. It was soon found impossible to fulfil the promises in the prospectus

as to analyses for the subscribers, funds fell off, and the Royal College of Chemistry was absorbed into the School of Mines (p. 752).

But about this time another result of Liebig's work was seen in the foundation by Mr. (afterwards Sir John) Lawes of the Agricultural Station at Rothamsted (p. 483). He had carried on experiments in the fields since 1837 with important results to agriculture, more especially those on the manuring of turnips by superphosphates—mineral phosphates dissolved in sulphuric acid—and had taken out, as a result, a patent in 1842, which led to the foundation of an important chemical industry, but it was not until 1843 that the systematic work of the station began. From that time to the present it has rendered incalculable service to the progress of agriculture in the field, in the feeding shed, and the laboratory. Experiments have been carried on with root and grain crops grown continuously on the same plot with or without the aid of manures; on the rotation of crops, and on the result of the feeding of animals in producing meat, milk, and manure. To state concisely the main results of this work is not easy. They have made clear the object, method, and results of manuring, the scientific explanation of the rotation of crops, and of the principles which underlie the production of fat and of muscle in farm stock. Sir Henry Gilbert, who was associated with Sir John Lawes in this work from 1843, and continued it after his death in 1900,[1] was a pupil of Liebig.

**D'ARCY POWER. Public Health, 1815–1846**

THE public health at the beginning of the century was good, in spite of the most neglected sanitary conditions and the most systematic overcrowding. Wages were high, and work was constant so long as the war continued, but with the Peace of 1815 and the bad season of 1816 came a reaction. Typhus and relapsing fever appeared in the rookeries of London, and spread as an epidemic through England. Relapsing fever disappeared

[1 The station was carried on by Sir John Lawes at his own expense till 1889, when he endowed it with £100,000 and certain lands, and appointed trustees. It is now (1904) controlled by a committee of nine, four of whom are nominated by the Royal Society, two by the Royal Agricultural Society, and the remaining three represent the Chemical and Linnean Societies and the founder's family.]

SAMPLES OF WHEAT GROWN AT ROTHAMSTED, HERTS.

*(By permission of the Lawes Agricultural Trust.)*

about 1819, but typhus remained endemic; and there was a second epidemic in 1826–27, associated with the financial crisis of 1825. The autumn of 1826 was marked by an outbreak of fever which, from the account of the morbid appearances left to us by the physicians who attended the cases, we now know to have been typhoid. The disease was not then recognised as a distinct fever, for it was not until 1849–51 that Sir William Jenner drew particular attention to the distinctive anatomical lesions which now make its recognition a matter of everyday occurrence, and at the same time have led to its rational treatment. The ten years from 1830–40 were particularly unhealthy. Typhus, Asiatic cholera, small-pox, and influenza spread over the country in epidemic waves. The cause of these epidemics was not far to seek. Trade was getting worse and worse; the price of provisions rose steadily. Hygiene did not exist, and as yet the State took no interest in the public health. The poor, both in town and country, lived amongst the most filthy surroundings, and under the most demoralising conditions. Their standard of comfort was very low, and overcrowding was the rule rather than the exception. The sanitary condition of the wealthy classes was not much better, for the broad principles of drainage were less understood than they had been in Nineveh, and were certainly not as good as they were in Rome under Augustus. In Rome, at any rate, we know that the sewers were cleansed occasionally, for the magistrate, under whose auspices such a work was accomplished, would afterwards descend the newly cleansed channel in a boat; but no one ever heard of the sewers in this country being surveyed by any municipal authority. The sanitary appliances were of the rudest description; cesspools were frequent, and were usually placed in the basement of the houses; the water supply was abominable; the streets were badly paved, badly lighted, and badly guarded.

State Medicine.

The unhealthy decade was not without its uses. It brought home to the Government the shameful manner in which the State had hitherto neglected an important part of its duties. The appearance of Asiatic cholera at Sunderland in 1831 had led to the formation of a Board of Health, and the new system of registering births, deaths, and marriages came into force upon 1st July, 1837. The care of the public health, hygiene, or the science of State medicine was still unknown, and there was no

sanitary measure upon the statute books at the time of the queen's accession. The foundation of the science was laid in 1838, when (Sir) Edwin Chadwick, as Secretary to the Poor Law Commissioners, addressed a letter to Lord John Russell, the Home Secretary, pointing out that preventable disease was a cause of pauperism. The State further acknowledged its duties in relation to the prevention of disease when in 1840 it rendered penal the inoculation of small-pox, and established a system of gratuitous vaccination. It made further progress in the same direction when it began to consider the dangers attending burials within the limits of the various towns, though the practice was not prohibited until 1852. It was not until 1846 that a temporary Act for "the Removal of Nuisances and the Prevention of Epidemic Diseases" enforced the first and most elementary sanitary regulations. A still more important Act was passed in the same session, enabling local authorities to establish public baths and wash-houses. Lord Morpeth's "Health of Towns Bill," which may be looked upon as the foundation of State medicine, was introduced into Parliament in 1847; but, as it failed to pass the Commons, it was re-introduced in the following session, when it received the Royal Assent on the last day of August, 1848. Its provisions were first carried out by a central Board of Health, then (1858) by the Privy Council, and since 1872 by the Local Government Board. Sanitary legislation, at first confined to towns, was extended to the rural districts in 1872, and local sanitation is now administered by the "District Councils" under the Local Government Act of 1894

H. C. JENKINS. Mining and Metallurgy, 1815-1846.

THE mining and metallurgical industries of the United Kingdom assumed a position of prime importance in the trade of the country at the beginning of the century. This they have maintained, so that in later years they have become an index of the national prosperity.

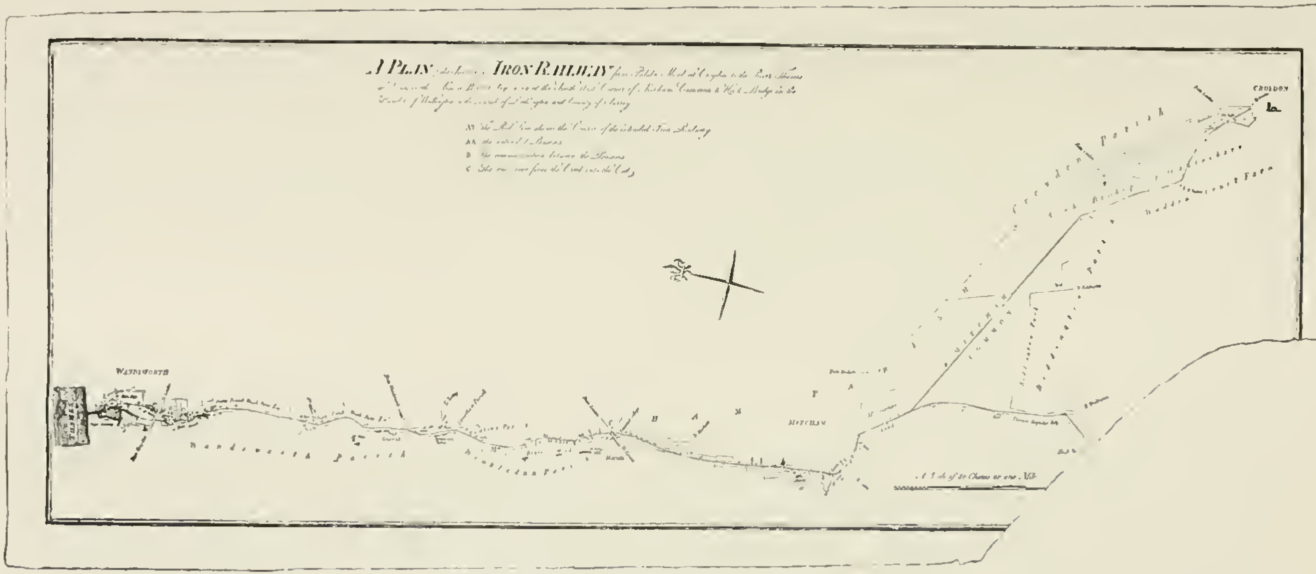
At the opening of our period, metal was daily displacing wood as a material for articles of common use. The inventive skill of men such as Arkwright, Watt, and Maudslay (Vol. V., pp. 414, 625 *seq.*, 813) had extended the use of the metals beyond the sphere of artistic or philosophical applications to that of durable and industrially useful machinery, possessing a degree

of accuracy of form and precision of movement hitherto unknown in the purely mechanical arts, whilst Newcomen and Watt had (Vol. V., pp. 426, 625) given to the world practical means by which the energy in fuel could be utilised in setting this improved machinery in motion. Thus manufacture was no longer limited by the resources of hand labour or of animal power, or by the restraints of place imposed by the use of water-power, while it was but just released from the grave restrictions and burdens imposed by the long French War.

**Concentration of Industry.**

For half a century the country had been experiencing the benefits due to a few good roads and canals made with the special object of trade in view. The waggon had been displacing the pack-horse, and when it is stated that each ton of goods carried on the backs of horses cost a pound sterling for every twenty miles, it will be seen how desirable some relief was from such an impost on trade, because the economical manufacture of goods by the aid of machinery, itself too ponderous to be readily portable, involves a considerable amount of carriage both of the raw material and of the finished product. At the beginning of the century, coal was one of the articles in connection with which the need of cheap carriage was severely felt, and the success of the Wandsworth and Croydon Tramway (1801 : p. 273) and other similar lines led to the further replacement of stone by iron as the material for roadways in the colliery districts. Several inventors were meanwhile busy with attempts to utilise the steam engine for the purpose of haulage. The new form of road, or rather tramway, was seen to offer special advantage to steam locomotion, on account of the more perfect and rigid service that it presented—a surface that was, moreover, nearly independent of meteorological changes. But the mechanical engineers had some difficulty in perfecting the locomotive engine, and by the time that Stephenson in 1828 demonstrated its success, industries on all hands had become so developed as absolutely to necessitate the assistance of this new means of transport to prevent their being crippled by cost of carriage.

At the beginning of the century, Great Britain occupied the fortunate position of having her mineral resources, as well as the new engineering industries, in a better developed condition than those of any other country. She had, moreover, the




PLAN OF THE SURREY IRON RAILWAY

*(By permission of C. T. Davis, Esq., the Public Library, Wandsworth.)*

command of the sea. Hence very much of the increase of trade came directly into our hands. Thus on every hand large and increasing quantities of metals, chiefly iron, as well as of coal, were then required, so that the rate of development of the coal and iron trades was for many years phenomenal. It will be better, for the sake of clearness, in a more detailed review to take the iron trade first.

**Cast Iron.**

Crude cast or pig iron is the most widely used metal at the present day in the industrial arts, sometimes as the material out of which articles may be formed by the operation of casting, but more generally as the substance from which the purer forms of the metal, such as steel of wrought iron, may be obtained, and it is easy to trace by the trade in pig iron alone the industrial progress that has taken place. But it must be remembered that this large industry is absolutely dependent on two others, coal mining, which indeed will be seen to be of even greater importance than the iron trade, and ironstone mining, which is of nearly equal importance with it.

The annual production of pig iron has been steadily increasing in Great Britain for several centuries. For the year 1806 there were no less than 161 furnaces in existence, producing 243,800 tons of pig iron. By the year 1827 the number of furnaces had increased to 284, and the annual output to 690,000 tons, the South Wales and the Staffordshire districts each contributing about one-third of the total. Except in Scotland, where raw coal was the fuel, the use of coke in the furnaces had become almost universal (Vol. V., pp. 417, 631), though singularly enough a solitary charcoal furnace has been, and still is, worked at Backbarrow in Cumberland [1904].

**The Blast Furnace.**

In following the development of the industry it must be remembered that the blast furnace producing cast iron has two functions to perform. It has to reduce the ore first to the state of metal. This is effected in the central and upper part of the furnace by the united action of carbon and of carbonic monoxide at moderately elevated temperature upon the ore, which may be considered to be always an oxide of iron, for when carbonate of iron is the ore it speedily becomes oxide by the simple act of heating. The reduced metal, now in a state of fine division, must then be melted, during which operation it takes up carbon and becomes cast iron; at the same time the ash of the coke and

the foreign matters from the ore fuse, and can be withdrawn as a slag. It must be further noted that the melting requires a very high temperature, such as is only attained at the base of the furnace where the blast of air is admitted.

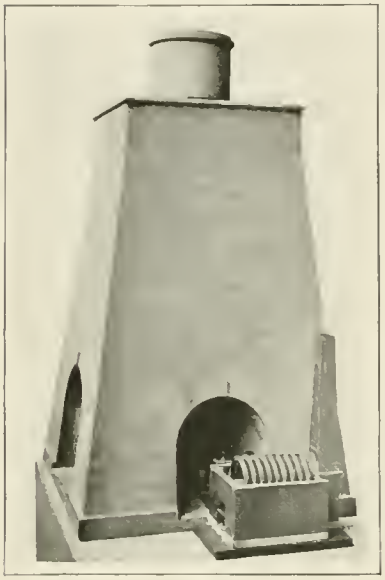
The very early iron furnaces did not produce cast iron, save as an accidental product, but a steely wrought iron that never melted but was picked out of the furnace after the operation was finished. This peculiarity of their product was due to the fact that the furnaces, which were, comparatively speaking, very small, employed charcoal as fuel, and this had great power of reduction, but the temperature attained was insufficient to melt the iron, or to highly carburise it during the few hours occupied by the operation. But in the case of larger blast furnaces having cast iron as the intentional product, in order to carry out the operation with as small an expenditure of coke as possible, what is required is the attainment of a very high temperature by the complete combustion of the coke to carbon dioxide at the base of the furnace, so as to get the highest possible temperature for the actual melting, as well as a suitable though not excessive production of reducing gases in the upper portions of the furnace. Up to about the year 1828 a gradual improvement in the size and shape of the furnaces was made, but without any radical change in practice. In that year Neilson, though for inadequate reasons, thought it would be of advantage to feed all kinds of furnaces with hot air, and he obtained letters patent for the scheme Heated air had, however, been experimentally used by others at the Bradley Iron Works as early as 1804 for blast furnaces, and its use abandoned. But the use of heated air enables a high temperature to be obtained without an excessive production of reducing gases and consequent waste of fuel in the furnace, and when Neilson's improvement was applied to the Scotch blast furnaces, a notable saving of coal was effected, amounting in many instances to a reduction of eight tons of pit coal per ton of pig iron to about 5¼ tons, and representing frequently an economy of £1 sterling for that amount of product. In English furnaces, where the coal was generally coked before it was used, the saving naturally could not be so great, but it was 20 per cent. The production increased to 1,309,000 tons in 1840, when 490 furnaces were in existence in the country, and 402 of these were at work, the

**Hot Blast**

**Growth of the Iron Trade.**

amount of coal required diminishing to an average of about $3\frac{1}{2}$ tons per ton of iron. In 1843 the rapid extension of the railway system caused a large increase in the demand, and the production was 2,000,000 tons in the year 1847, increasing five years later to 2,700,000 tons, when 497 furnaces were working out of a total of 655. The increasing yield per furnace was due partly to an increase in size, but partly to the attention now commencing to be paid by the ironmasters to the study of the scientific problems presented in the course of their work. Up to this time the combustible gases, necessarily present in the upper part of the blast furnace for the purpose of reducing the ore to the metallic state, had been invariably allowed to burn as they issued from the mouth of the furnace, but in 1845–48 Budd thought to utilise the gas by withdrawing it from the furnace immediately below the top, and to burn it in his stoves for the purpose of heating the air for the hot blast. He found that he had enough gas and to spare, so that another large economy could be effected. Soon after this the "closed" top to the furnace was invented, and then practically all these gases could be usefully burnt, either in the hot-blast stoves or under the steam boilers, for the blast engines. Strange as it may seem, it was many years before the use of the closed top became general, yet in the end the advantages of its use have been universally recognised, and the impressive, but useless and expensive, spectacle of a quarter of the fuel employed burning in absolute and injurious waste, is to be seen no more. At about this date, also, the increasing size of the furnaces led to the adoption of

Use of Waste Gases.



MODEL OF A SOUTH WALES BLAST FURNACE BEFORE 1850.
(*Victoria and Albert Museum.*)

ironwork in their structural casing in the place of brickwork or of masonry. Now the change is complete, and only the fire-resisting part is made of brick.

Coal.

The activity in the manufacturing industries has demanded and, indeed, has mainly resulted from, a liberal supply of fuel, large quantities of which are required in the metallurgy of iron, whilst the steam engine is used with the deliberate view of substituting the energy derived from fuel for that derived from animal labour. Coal had displaced most other forms of fuel in this country by the beginning of the century, and this largely accounts for the industrial activity itself, for it is computed that a seam of coal two feet thick and an acre in extent will supply as much energy as could be obtained by burning all the trees that could be grown in the same sized piece of land for ten thousand years.

LORD FARRER. The Railway System.

Travellers between London and Brighton may notice to the west of the line near Purley an embankment long disused. Few, however, know that this is part of the first public "iron railway" for which an Act of Parliament was obtained in this country, by name the "Surrey Iron Railway Company," formed in 1801, to carry coals from Wandsworth to Croydon and Reigate, and to bring back stone and lime to be shipped on the Thames. But though this and several other small lines were formed at the beginning of the century, to be worked by horse power only, it was not until the period that we are now considering that the foundations of the present English railway system were laid.

George Stephenson.

The early history of our railways is inseparably connected with the picturesque personality of George Stephenson, who was born in 1781 at Wylam Colliery, near Newcastle, of parents too poor to afford him as a lad even the schooling necessary for learning to read and write: the family of eight souls, indeed, dwelt in one room of a cottage. He lived not only to realise great wealth himself, but to see the face of England so much changed by the invention which his own industry had the chief share in developing, that it was actually cheaper—to use his own words—for the poor man to go by steam than to walk. The time was very favourable. The close of the French war had opened the seas to English commerce. A vessel moved by steam

power was sailing on the Clyde by 1812; another crossed the Atlantic in 1819 (p. 452). Between 1821 and 1824 Liverpool exports had increased from 71,000 to over 1,000,000 tons. The inland canal navigation companies were quite unable to cope with the traffic that was pressing upon them. They attempted to meet the difficulty by the most foolish and unpopular of all measures —that of a general raising of rates for conveyance. And so we find that the first survey of a railway between Liverpool and Manchester was made, principally at the expense of Joseph Sandars, a Liverpool merchant, in the year 1822, and the first prospectus issued October 29, 1824. It contained these words: "It is competition that is wanted, and the proof of this assertion may be deduced from the fact that shares in the old Quay Navigation, of which the original cost was £70, have been sold as high as £1,250."

The Locomotive.

During all this time George Stephenson had been working quietly at the improvement of his locomotive engine in Northumberland. He had long been convinced that steam power was destined to supersede other modes of traction. As far back as 1769, a French officer named Cugnot had constructed a steam locomotive, which worked on ordinary roads in Paris. Trevithick, a Cornishman, had also constructed a successful road locomotive, which he exhibited in London in 1803, and a tramway locomotive—the first in Britain—which worked upon the Merthyr tram-road in 1804. Blenkinsop, of Leeds, followed with another locomotive in 1811, to be used at his colliery at Leeds in lieu of horses. Blackett, of Wylam, a village near Stephenson's home, was at the same date constantly experimenting; and Stephenson, then an engineer at Killingworth, was as constantly following the experiments. At Killingworth, Stephenson constructed in 1814, for Lord Ravensworth, his first locomotive, "Blucher," and devoted the next two years to improvements in design of both engine and track; and he had proved in practice on these coal roads the superiority of locomotive over any other form of traction by the date of the inception of the Stockton and Darlington Railway.

The Stockton and Darlington Railway.

This line was originally intended only for the conveyance of coals and goods to be hauled by animal power or stationary engines; and the first application, backed by Edward Pease and many of the Quakers of Darlington, for power to construct it,

was made to Parliament in 1818. It was defeated by the Duke of Cleveland, on the ground that it would interfere with his fox-covers. In 1821, however, the Bill passed, and in 1823 George Stephenson was appointed engineer. At his instigation,

GEORGE STEPHENSON, AFTER H. P. BRIGGS, R.A.

an amended Bill was obtained, a clause of which gave the company power to work the line by means of locomotive engines, and to convey passengers—the first Act in England to give such power. The year 1823, therefore, may be looked upon as the real beginning of the modern railway era in England. For sanction was given by Parliament—and it is necessary to note that such sanction was, and is still, essential to undertakings of any magnitude, because Parliament alone can compel any

individual in this country to part with his land against his will —to a line forty miles long, and estimated to cost a quarter of a million sterling.

**The Liverpool and Manchester Railway.**

From that day to this, moreover, though improvements have been made in details of the locomotive, the principle of George Stephenson's engine remains unaltered, and his machine, which at the opening of the Liverpool and Manchester Railway in 1830 carried Huskisson's body, maimed by a deplorable accident, at the then unheard-of speed of 36 miles an hour, had only been enabled to double that pace in 1885, while the reduction of fares during the same period between the same places was only from 4s. to 2s. 6d.

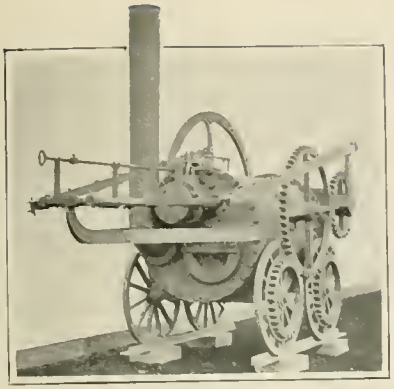
Great as was the success of the Stockton and Darlington line, public attention was not thoroughly aroused until the project of the Liverpool and Manchester Railway came to the front in 1824. By a fortunate chance George Stephenson was appointed engineer, as he was strong enough to withstand attacks of every kind. What these attacks were, even among the most educated class, may be gauged by the following words of a *Quarterly* reviewer of 1825, commenting upon a proposed line to Woolwich, which was to go at twice the speed of stage coaches:—

> "The gross exaggeration of the powers of the locomotive steam engine . . . may delude for a time, but must end in the mortification of those concerned. . . . We would as soon expect the people of Woolwich to suffer themselves to be fired off upon one of Congreve's ricochet rockets, as trust themselves to the mercy of such a machine, going at such a rate. We would back old Father Thames against the Woolwich Railway for any sum."

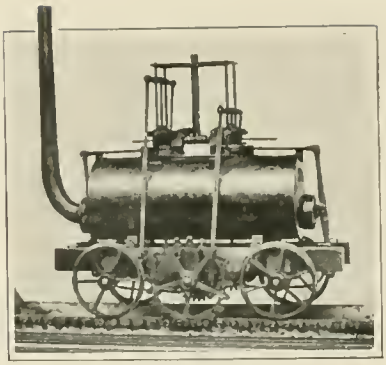
Stephenson himself, in evidence given before the Parliamentary Committee, had to limit his expectations of the speed of the locomotive to fourteen miles an hour. The opposition, backed by the landed and canal interests, was too much for the first Bill, and it was thrown out; only to be reintroduced and passed in the next year (1825).

**Steam Traction Wins.**

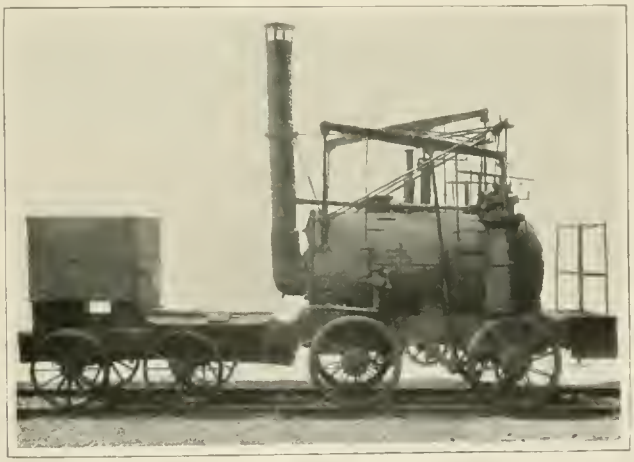
Even now the directors were undecided as to the nature of the power to be employed, and it needed the utmost persuasion of their engineer to give a fair trial to the locomotive. Into the details of that remarkably interesting race on October 6th, 1829, at Rainhill, between the three locomotives, "Rocket," "Novelty," and "Sanspareil," we have not space to enter, but the prize of £500 was won by Stephenson's "Rocket," which attained a



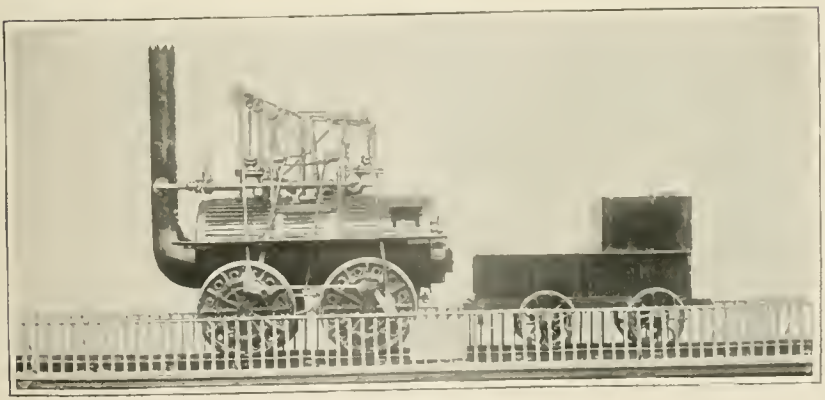
Trevithick's Tram Locomotive.
*(By permission of the L. & N.W. Railway.)*



Blenkinsop's Engine.
*(By permission of Messrs. Greenwood & Batley.)*



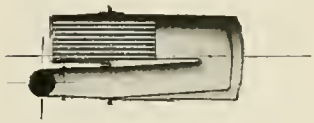
"Puffing Billy."



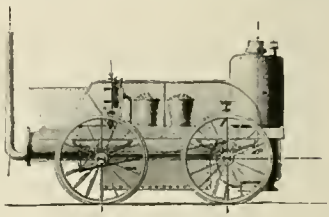
The "Locomotion.

EARLY LOCOMOTIVE ENGINES.
*(Victoria and Albert Museum.)*

speed of 29 miles an hour, and the power to be employed for tractive purposes was finally settled. The Liverpool and Manchester Railway—now part of the L. and N. W. system—was opened on September 15th, 1830, in a scene of great public excitement. The financial results were highly satisfactory, the £100 shares shortly rising to £200, and the traffic increasing beyond the wildest dreams of the promoters, so much so indeed that the whole of their limited stock of engines was employed in passenger traffic, a branch of business which had scarcely been considered in the prospectus.



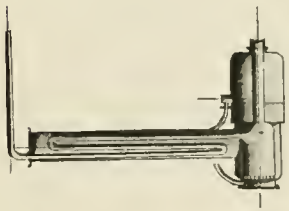
SECTIONAL PLAN OF THE "SANSPAREIL."



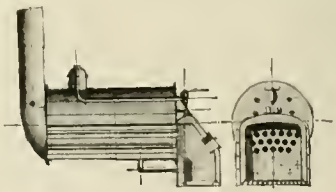
DRAWING OF THE "NOVELTY."

**Railway Development.**

Meanwhile the first of the waves of speculation which have occurred since at varying intervals, had swept over this country. Railways seemed to offer such a fine security, that we find a capital of nearly £22,000,000 was demanded for them in 1824–25. Even though only about £220,000 was actually paid up, the figure, considering that liability was then unlimited, is highly remarkable. The great success of the Liverpool and Manchester led to the foundation of all the principal lines at present existing. The Act of the London and Birmingham, the first long line—112 miles in length—was passed in 1833. It had in the previous session (1832) passed a second reading in the Commons by a majority of 79, and also Committee and third reading by large majorities, but had been rejected in the Lords, a rejection which, says an early writer, stirred up a most indignant spirit in the land. "There is a blindness which



SECTIONAL PLAN OF THE "NOVELTY."



SECTIONAL PLAN OF THE "ROCKET."
(*Victoria and Albert Museum.*)

THE "SANSPAREIL."
(*Victoria and Albert Museum.*)

will not see, and how shall it be expected that they should be able to calculate, whose schooling has gone little beyond counting the feet of a hexameter verse?"

Notwithstanding similar opposition from Eton and Oxford, the Great Western Bill passed in 1835, both seats of learning managing to push the line away, the first as far as Slough, the second as far as Didcot. The Rev. Edward Coleridge was asked whether the railway would not increase the trade of Windsor. "Trade," said he: "what trade has Windsor, except Windsor soap, and that is made at Egham?" The Act forbade any station on the G.W.R. within a certain distance of Eton College. When the rails were perforce extended to Eton and Oxford, clauses were inserted in the Acts[1]—to this day unrepealed—compelling policemen to patrol the line to prevent the access of Eton boys, and giving the officers of the University of Oxford access at all times to the railway. Similarly in the

THE "ROCKET."
(*Victoria and Albert Museum.*)

[1] Local Acts, 1835, c. 107, s. 100; 1843, c. 10; 1845, c. 184, s. 143; 1846, c. 135, s. 24.

Eastern Counties Act,[1] a clause, still unrepealed, forbade the company to run trains to Cambridge at certain hours on Sundays on pain of forfeiting money to Addenbrooke's Hospital. These instances are quoted to show the strong opposition which was met with and had to be conciliated, for in more modern Acts such clauses interfering with public convenience for the sake of private institutions are almost unknown, if we except the case[2] of Lord's Cricket Ground, which almost prevented the Great Central Railway from entering London.

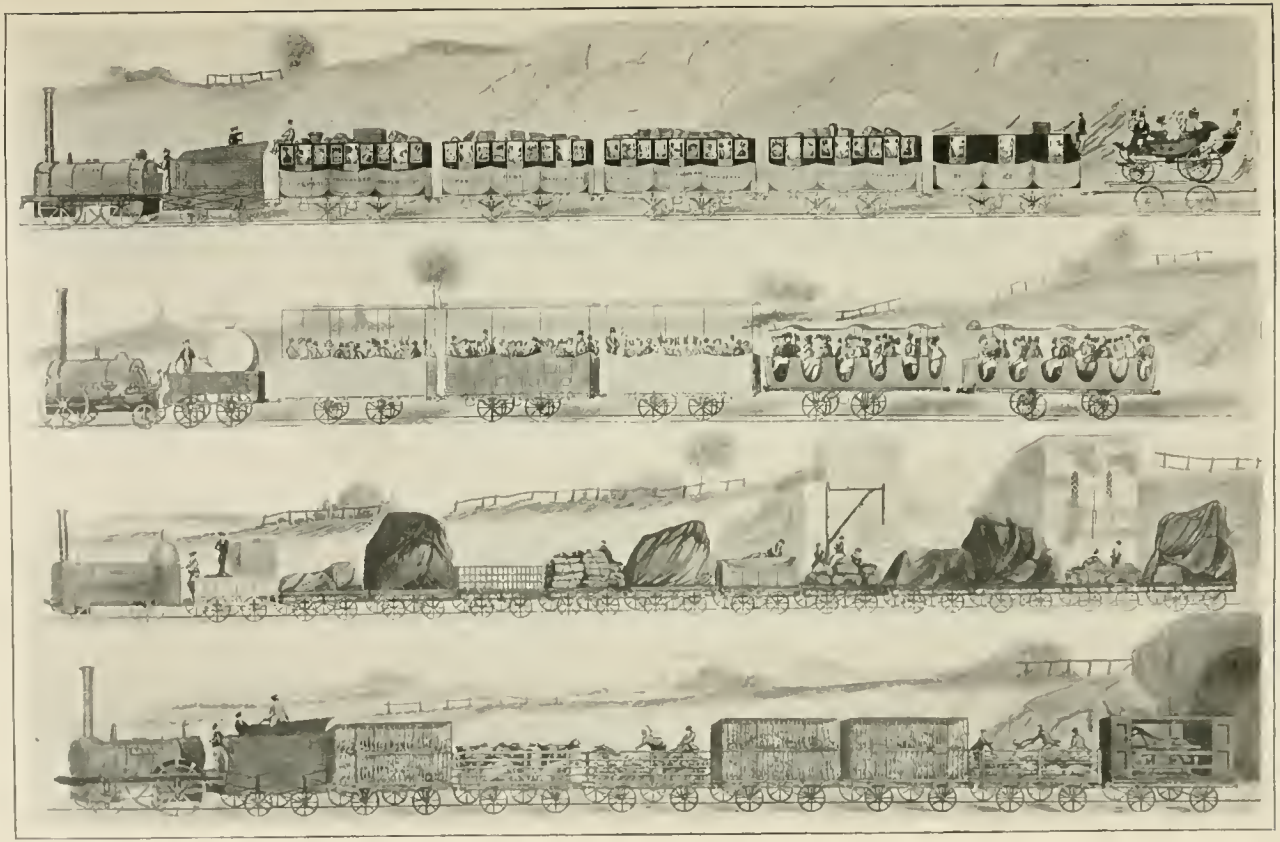
**Battle of the Gauges.**

The Great Western Railway demands attention for other reasons than the opposition of the learned bodies of Eton and Oxford. It is intimately connected with the name of Brunel, its engineer. A man of daring and ingenious mind, he was quite deficient in the special faculty which George Stephenson possessed, of giving due weight to the commercial side of engineering. The gauge of the English railway had been determined by the width of the coal tramroads near Newcastle to be 4 feet $8\frac{1}{2}$ inches. Stephenson saw from the first the importance of keeping all English railways the same width. When his friend Joseph Locke was constructing the Canterbury and Whitstable line, he came to ask Stephenson what gauge he should adopt. "Make it of the same width as mine," said George Stephenson, "though they may be a long way apart now, depend upon it they will be joined together some day." But to Brunel's mind the very fact of one system being adopted was an inducement to experiment upon the advantages of another. Other railways were of 4 feet $8\frac{1}{2}$ inches gauge; he persuaded his directors that 7 feet was a better width. Other railways used cross sleepers; his must be longitudinal. Other lines had up and down stations on each side of the line and the passengers crossed to them; he must have his stations on one side of the line only, while the trains crossed instead of the passengers. Steam had proved its success as a tractive power; Brunel maintained that the atmospheric system was better for steep grades, and tried it with disastrous effects on the South Devon line.

**Brunel's Ideas.**

All these eccentricities experience has condemned, and no sober investigator can doubt that time has shown Brunel to have been completely wrong, and to have wasted large sums of money.

[1] 1844, c. 62; 1862, c. 223, s. 140. [2] 1893, c. 1, s. 52.



EARLY ENGLISH ROLLING STOCK.

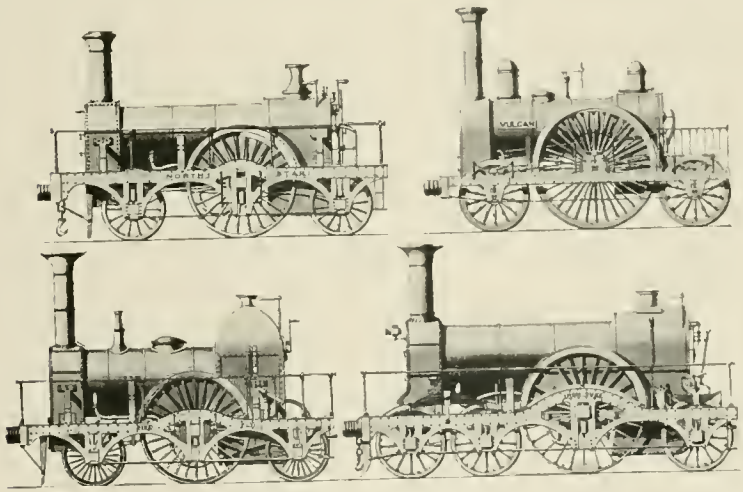
*(From prints of 1833 at the Victoria and Albert Museum.)*

But from the historical point of view the most astonishing fact is that not only Parliament and the public, but even the directors of the Great Western Railway themselves, should have had no inkling of the exchange between the various parts of the kingdom which railways were to produce. It was stated and firmly believed by the advocates of the wider gauge, that the

ISAMBARD KINGDOM BRUNEL.
*(Engraved by Henry Cousins, after J. C. Horsley, R.A.)*

district which the G.W.R. served was entirely separate from the rest of England, and therefore that the transhipment necessary for goods would be infinitesimal. The idea that in fifty years through expresses would be running from Glasgow to Plymouth, or from Birkenhead to Bournemouth, entered their heads as little as the necessity for through goods and coal waggons from the West of England stations to and from the London docks and other cities and ports, if their district were to meet the competition of the rest of England on equal terms. A clearer proof does not exist that the internal trade of the

country was in its infancy. The question of gauge was not dealt with by Parliament until the year 1846, when an "Act for Regulating the Gauge of Railways" (9 & 10 Vict., cap. 57) was passed, fixing 4 feet 8½ inches for future English and Scotch, and 5 feet 3 inches for Irish, railways. This Act was the outcome of the report of a "Gauge Commission" of the previous year, which conducted a careful inquiry. The experiments included




GREAT WESTERN ENGINES.

*(From a print in the Victoria and Albert Museum.)*

very interesting tests of speed on the broad gauge Great Western between Paddington and Didcot, and narrow gauge Great North of England[1] between York and Darlington, in which the broad gauge attained an average speed of over 50 miles an hour with a train of 80 tons, the narrow gauge with a train of the same weight attaining 44 miles. On grounds other than those of speed, however, the Royal Commissioners recommended the narrow gauge for future railways. The wisdom of their view was confirmed when the Great Western in 1892 converted the only remaining broad gauge sections of its system to the normal width.

No very special incidents marked the passing of Bills for

[1 The company is still extant, but its line is part of the North-Eastern system.]

our other great London lines, which occurred at the following dates :—London and Birmingham, 1833; London and Greenwich, 1833; London and Southampton, 1834; London and Croydon, 1835; Great Western, 1835; South Eastern, 1836; Eastern Counties, 1836; London and Brighton, 1837; Great Northern, 1846; London, Chatham and Dover, 1860; Midland, 1863; Manchester, Sheffield and Lincolnshire (now Great Central), 1893.

**The Crisis of 1837.**

But the railway mania of 1836 and the subsequent panic have been so overshadowed by the greater mania and panic of 1845, that it is well to recall them. Almost all the projects of 1845 were mooted in 1836, and the crash which followed in 1837 was one of the worst known. "Consols fell 4 per cent. . . . In Manchester and its vicinity 50,000 hands were unemployed for six months. At Paisley 20,000 workmen were idle. At Glasgow nearly half the labouring classes were idle."[1] Nevertheless all the great lines were being built, and as they opened took the place of roads as the real highways of the country. The mails were sent by train between Manchester and Liverpool from 1830. Each succeeding year saw the death of some celebrated coach with the extension of the rails. In 1841 died the Brighton, in 1842 the Glasgow and Edinburgh, in 1843 the last Southampton coach The Queen made her first journey on the Great Western on June 18th, 1842; the Prince Consort had used the line some time before this.

**Railway Legislation.**

Parliament began to see that some general legislation was necessary. The Railway Regulation Act, 1840, reciting that "it is expedient for the safety of the public to provide for the due supervision of Railways," handed over certain general powers of regulation to the Board of Trade. This was followed by various Acts intended to secure the safety of the public, the most important of which is the "Railway Clauses Act, 1845," incorporating the provisions usually introduced into each private Railway Act into one General Act.

These Acts, however, did not give to a Government Department any considerable powers. The reason is obvious—that in Great Britain alone, among European countries, no penny of Government money had been contributed to railway enterprise, and therefore there was no justification for claiming the control exercised abroad. The powers of the Board of Trade were—

[1] Francis, vol. i., p. 301.

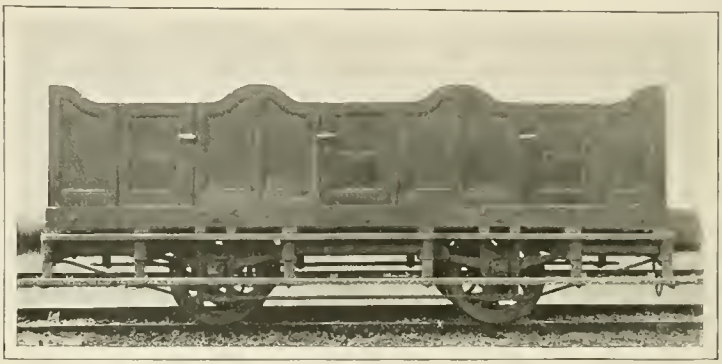
until the year 1889—limited to securing safety to the public, and they could only interfere *before* lines were opened. In Parliament itself the railway interest was so strong that the Act now known as "The Cheap Trains Act, 1844"—introduced by Mr. Gladstone in a speech in which the remarkable words occur, "I would no more trust the railway proprietor on railway matters than I would Gracchus speaking of sedition," and backed by the arguments of Sir Robert Peel—is a mere skeleton compared to the Bill as originally drafted. It did indeed attain one object—that of showing the railway companies the value of cheap fares; and it also gave Government the option of purchasing all future railways in twenty-one years—an option not exercised owing to the adverse report of perhaps the most important inquiry into railway matters ever made in this country, the Royal Commission of 1865-67, presided over by the late Duke of Devonshire. We have said that the Act of 1844 taught the railway companies the value of cheap fares. A contemporary says: "The third-class passenger down to 1845 had no legal status at all. Many companies would not carry him at any price; others put him in an open goods truck, with movable seats placed across it, and charged him 1½d. a mile for the luxury too. He was conveyed with other unclean animals by cattle trains, he was shunted about in his bufferless box for hours, and when at last he reached his destination it was to see a notice that 'the company's servants are strictly ordered not to porter for wagon passengers.'"

**The Cheap Trains Act.**

But in 1844 it was enacted that along every line one train each way daily must be run at an inclusive speed of not less than twelve miles an hour, conveying passengers in covered carriages at a penny a mile. The companies soon began to find that this cheap traffic, against the compulsory carriage of which they had vigorously protested, was the most profitable branch of passenger business, and continuous improvements were made in the speed and comfort of conveyance from that date until 1872, when the voluntary action of the Midland Railway in admitting third-class passengers to all trains without exception completed the revolution in travel. Indeed, the figures were such as no sensible business men could overlook.

The table of decennial figures given below, which is taken from the Parliamentary returns, is perhaps the most remarkable

testimony that exists to the democratic tendency of the railway. The first row of figures—viz. for 1845—is for the year *before* the Cheap Trains Act came into force, when there was no compulsion to convey third-class passengers. Between 1845 and 1890 the



A PRIMITIVE THIRD CLASS CARRIAGE, STILL RUNNING, LATE IN THE NINETEENTH CENTURY, ON THE BODMIN AND WADEBRIDGE LINE.

*(From a photograph, by permission of the London and South-Western Railway Company.)*

first-class receipts just doubled, whereas the third-class receipts became 32 times as large.

GROWTH OF PASSENGER TRAFFIC—UNITED KINGDOM.

| Year. | Numbers. | | | | Receipts. | | | |
|---|---|---|---|---|---|---|---|---|
| | 1st Class. | 2nd Class. | 3rd Class. | Mixed Classes. | 1st Class. | 2nd Class. | 3rd Class. | Mixed Classes. |
| | | | | | £ | £ | £ | £ |
| 1845 | 5,474,163 | 14,325,825 | 13,135,820 | 855,445 | 1,516,805 | 1,598,115 | 651,903 | 209,518 |
| | | | 3rd & Parly. | | | | 3rd & Parl. | |
| 1850 | 7,734,728½ | 24,226,668½ | 34 797,723 | 81,055 | 1,969,246 | 2,594,817 | 1,899,739 | 1,470 |
| | | | | Season Tickets. | | | | Season Tickets. |
| 1860 | 20,625,851 | 49,041,814 | 93,768,013 | 47,894 | 3,170, 935 | 3,944,713 | 4,162,487 | 272,807 |
| 1870 | 31,839,091 | 74,153,113 | 224,012,194 | ... | 3,948,812 | 4,925,542 | 7,473,727 | 686,488 |
| 1880 | 38,767,926 | 65,034,870 | 500,082,229 | 502,174 | 3,944,033 | 3,530,391 | 14,830,961 | 1,456,274 |
| 1890 | 30,187,067 | 62,859,854 | 724,697,125 | 1,259,221 | 3,193,691 | 2,645,705 | 21,142,847 | 2,316,384 |

**Speculation of 1845.**

The railway mania of 1845 and the rise and fall of Hudson, the "Railway King," have attracted, perhaps, more attention than they deserve. The existing railways had been doing well, the London and Birmingham, the Grand Junction and the York and North Midland paid 10 per cent., the Stockton and Darlington,

15 per cent. But no one expected in 1844 the wild speculation that was to follow in 1845 and 1846. In 1844 797 miles, in 1845 2,883 miles, and in 1846 4,790 miles received Parliamentary sanction. The streets near the stock exchanges were impassable, the gambling fever seized on all classes. From a return made to the House of Commons, it appears that among the dealers in railway undertakings were 900 lawyers, 364 bankers, 257 clergymen, 157 members of Parliament. When the crash came in October, it involved literally thousands in ruin. The collapse of 1846 and the quiet decade which followed mark the end of the first period of English railway history. The interest also shifted from the construction of railroads to problems connected with their working. It is true that in 1885 the mileage of line in the United Kingdom was eight times that of 1845—the figures are accurately, 2,441 in 1845, 19,169 in 1885—but the advance of engineering skill has made railroad building merely a question of money.

The economic and social effects of the new power were felt, and the interest shifted from engineering to that of policy and rates. Cheaper steamships, combined with free trade, and the extension of pioneer railways into the heart of the American

KING HUDSON'S LEVÉE, 1845.

*(Reproduced by special permission of the Proprietors of "Punch.")*

continent, enabled countries more favoured than our own to send us corn at a price with which our farmers could not compete. Labourers could leave their old homes to seek for work in towns or in new countries. As the competition of the sea influenced

three-fifths of British rates[1] the tariffs often appeared illogical, and presented anomalies real or apparent, which caused a strong outcry from an industry now depressed, but once so powerful and prosperous as that of British agriculture.

**Railways and the State.**

Many thought that the remedy was to be found in State purchase and the adoption of an absolutely equal system of rates. It was feared that the power of these "gigantic monopolies" as they were called, would be too great, and between 1844 and 1881 no less than six Royal Commissions or Select Committees of Parliament examined into the general question. Previous Committees had sat in 1836, 1839, and 1840. These six were—a Committee of 1844 (Mr. Gladstone's); a Committee of 1846; a Commons Committee of 1853 (Mr. Gladstone's and Mr. Cardwell's); a Royal Commission of 1865–67 (Duke of Devonshire's); a Joint Committee of 1872; a Committee of 1881–82. A Joint Committee on Railway Rates also sat in 1892–93, and a House of Commons Committee on the same subject in 1894.

From the Committee of 1844 onwards the general principle of Parliament has been to declare that the Companies have no special vested interest. "Nothing in the nature of a vested interest" . . . says the 1844 report, "ought to be recognised by Parliament as attaching to existing railways."

The engagement between the promoters and the public "conveys to the promoters no right," says the Report of 1853, "that these privileges shall be exclusively maintained when they cease to be consistent with the general advantage."

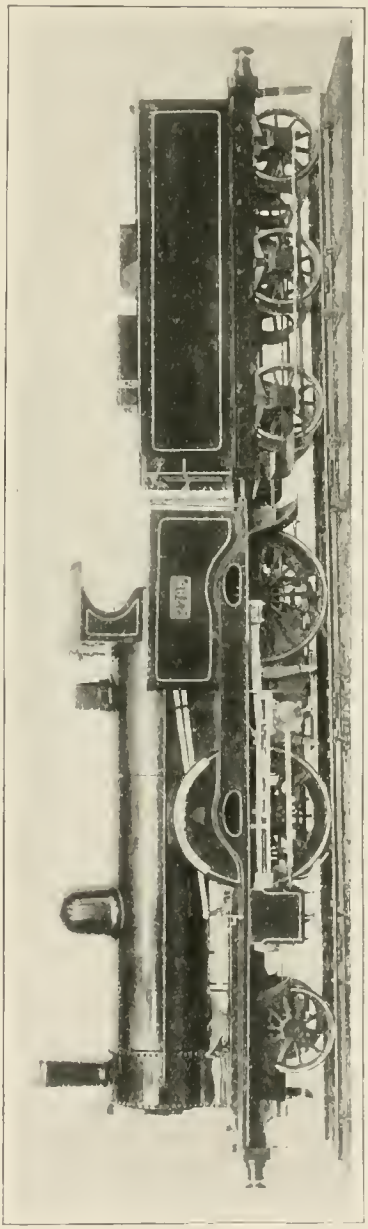
The Royal Commission of 1865–67 reports: "When a railway company comes forward for additional powers, Parliament shall take that opportunity of revising the maximum rates of conveyance, as it may appear reasonable."

In this, as in all other departments of English history, we find the vindication of the absolute supremacy of Parliament. From the days of Sir Robert Peel, who, in the introduction in 1842 of a Bill to regulate railways, stated, "I have reason to doubt very much whether all the railway companies and railway proprietors in the country would have the power to prevent Parliament from adopting any effectual regulations they thought fit," to our own day, England has seen no such difficulties

[1] *Vide* Report of Joint Committee of 1872.

between the State and the Companies as those which led in America to the institution of the Interstate Commerce Commission.

Not that our Railway Commissions have attained in all cases an unqualified success. Their history is curious. In 1840 and 1842 the Board of Trade was given certain powers of control in the interests of public safety. In 1844 a separate Commission was appointed whose main duty was to report upon new railway schemes. This impossible task led to the jealousy of Parliament, and the first "Railway Commission" died in a year. In 1846 another was appointed with far less powers, which also died of inanition after five years. The great Railway and Canal Traffic Act of 1854—the result of Gladstone's and Cardwell's Committee of 1853—virtually transferred railway litigation to the ordinary Law Courts (the Court of Common Pleas), and in many directions was a real success. It failed, however, in technical questions, and the result of the Joint Committee of 1872 was the passage of the Railway Regulation Act, 1873. This appointed a Railway Com-



MODEL OF A LONDON AND NORTH-WESTERN RAILWAY ENGINE, 1885.
(*Victoria and Albert Museum.*)

mission of three members, one a railway man, one a lawyer (by the Railway and Canal Traffic Act of 1888, 36 & 37 Vict., cap. 48, the lawyer is to be a judge of the Superior Court), and one other, who were to decide questions arising under the Act of 1854, and subsequent Acts. On questions of fact its decision was to be final: on questions of law it was subject to appeal. This Commission, with some alterations in its duties and powers made by the Act of 1888, has continued until now, and if it has not satisfied all the expectations which were formed of it, has at any rate been better than anything that has gone before.

With all the faults of our English system of purely private enterprise tempered by competition, the controlling power of Parliament, though frequently grumbled at, has never been seriously denied by these gigantic corporations, whose capital in 1895 exceeded that of the National Debt by more than 300 millions sterling. It is possibly for this reason that the movement in favour of State Railways has made so little progress in England. The waves of State Socialism have at various times swept part or the whole of the railway system of France, Italy, Germany, Austria, Belgium, and most other countries into the net of the State, but in England alone, hitherto, the movement has had no serious support. And as long as the words of the last Committee of Parliament which has reported on the question hold good, our present system seems likely to remain unaltered. The words were as follows:—

"Your Committee, in conclusion, reports that, on the whole of the evidence, they acquit the railway companies of any grave dereliction of their duty to the public."

R. E. PROTHERO. Agriculture, 1832-1846.

The Distress Continues.

In the first four years of this period, the agricultural distress in which the country was plunged after the peace of 1815 continued with little or no abatement. Landlords with mortgages or rent-charges on their estates were ruined; tenants, farming on borrowed capital, became parish paupers; bankruptcies, seizures, executions, imprisonment for debt, were still universally prevalent. Rents fell into arrear; tithes and poor rates remained unpaid; labour-bills were reduced; improvements were discontinued: live-stock dwindled. Tradesmen, innkeepers, and shop-

keepers, who depended on farmers as their principal customers, were involved in the same ruin. The failure of numerous country banks added to the distress of rural districts. Misery bred discontent, and discontent created disturbances which were fostered by political agitators. While the Luddites broke up machinery, "Swing" and his proselytes were at work from Dorsetshire to Lincolnshire. Gangs of labourers avenged the fancied conspiracy of farmers by burning stacks and ricks, or by wrecking the shops of butchers and bakers.

SWING, THE RICK-BURNER.

It was on the clay farms that the distress was most acutely felt. Here, even on large holdings, the use of manure was almost discontinued; less capital and less labour were expended on the soil; wet seasons prevented the farmers from getting on their land; to make the rent, excessive cropping was resorted to. Confidence between landlords and tenants was destroyed, and recent experience created a profound distrust of leases. In many cases the heavier soils were abandoned; in nearly all the land was allowed to fall into miserable condition. On the light soil of the Eastern Counties, farmers had suffered comparatively little. The higher the farming, the less had been the loss. The spread of drill husbandry, better and more varied

rotations of crops, the abundance of natural manure provided by the practice of stall-feeding, and improvement both in sheep and capital, enabled energetic tenants to make farming pay, even in the midst of falling prices.

Revival after 1836.

After 1836, signs of reviving prosperity became manifest. The rapid growth of manufacture gave a fresh impulse to agriculture. The new system of the Poor Law lightened the crushing burden of rates, which fell from six and a quarter millions in 1834, to four millions in 1837. The Tithe Commutation Act of 1836 encouraged landlords and tenants to invest their money in land, without fear that tithe-owners would intercept the increased profits derived from an outlay to which they had not themselves contributed. Wool, mutton, and beef rose in value; barley and oats sold briskly at enhanced prices. Farmers, who were fortunate with their wheat in 1838 and 1839, profited by the defective harvests, which in those years were generally prevalent. Farming entered on a new era of prosperity which, with certain fluctuations, continued down to 1876.

In 1812 the Royal Society had adopted the motto of "Science with Practice," and the general characteristic of agriculture during this period is the adoption of this motto. Hitherto bucolic life had been the pastime of the town, the inspiration of poets, the relaxation of statesmen, the pursuit of individual landowners. But, as a rule, farmers had neither asked nor allowed scientific aid. From 1836 onwards, on a larger and ever-increasing scale, capital and science, combined with practical experience, applied their united forces to agricultural progress. In 1838, the foundation of the Royal Agricultural Society—replacing the old Board of Agriculture, which expired in 1819—marks at once the revival of prosperity, the general recognition by landlords of their territorial duties, and the alliance of the man of science with the farmer. It proclaims the acceptance of new conditions; it indicates the direction in which agriculture was for the future to advance. Farming ceased to depend for its advance on the chance-directed discoveries of unlettered rustics; henceforward it enlisted in its service the capital of the wealthy and the experiments of the learned.

Science was applied to farming in ways so various as to

defy enumeration. Architects, mechanists, geologists, chemists, physiologists, statisticians gave their aid to the farmer, trebled his resources, lessened his risk, and placed at his command the means of economising the cost and increasing the amount of production. Vast capital was expended on farm buildings. Instead of rickety barns and tumble-down sheds, well arranged

LORD ALTHORP, FIRST EARL SPENCER, BY SIR MARTIN ARCHER SHEE, P.R.A.

*(By permission of the Right Hon. Earl Spencer.)*

and commodious farm buildings were erected. New means of transport and communication brought distant markets to the farmer's door. Railroads, steam navigation, and joint stock banks assisted the revival of his prosperity. The new Poor Law and the Commutation of Tithe Act have been already mentioned. But Acts for the enfranchisement of copyholds, for drainage and for enclosures, also helped the farmer in his distress. Steam and machinery lessened his toil and his expenses. Veterinary science made gigantic strides, and it was

no longer necessary to sacrifice valuable animals to the ignorance of quacks. The schoolmaster was abroad, and in 1842 the Royal Agricultural College was founded. Agricultural implements were improved, and their use more widely diffused. New rotations and new varieties of field crops were introduced. Live-stock was better bred, better fed, and better housed. High farming, good roads, good homesteads, good crops, good stock, good farmers became the rule and not the exception.

**Intensive Cultivation.**

Such are the general features of the period of prosperity which first showed signs of commencement in 1836. Its characteristic is the adoption of the rule of "Science with Practice." Cut off from the old resource of increasing the yield of the soil by enlarging the cultivated area, agriculture was driven to effect improvements in its methods. The age of farming by extension was ended: that of farming by intension had begun. Within the period 1832–45, the most striking improvements are those in the science of drainage and in the science of manures. To these two important points some attention must necessarily be given.

**Drainage.**

It has been said that the stress of the storm of 1815–36 fell upon the clay farmer. Without drainage he could not hope to recover his prosperity, or to compete, on anything like equal terms, with light, naturally-drained soils. With the need came the man. In draining the land of surface water, the ordinary practice was to throw the land into ridges, which were often several feet in height. The effect of such a system was not only to leave the furrows standing pools of water, dammed up by the raised headlands, but also to wash the soil bare from the ridges into the furrows, leaving the high ground too poor, and the low too wet, to grow crops. Sometimes the ridges were of great height. In Gloucestershire, for example, at the beginning of the century, Marshall notes that, as he stood in a furrow, a man, crossing a ploughed field towards him, was lost to sight in every furrow into which he descended. In Leicestershire, the Eastern Counties, and especially Essex, the art of thorough drainage was better understood. To carry off the surface water, shallow trenches were cut, which were filled in with straw, ling, sticks, stone, or turf, and then covered over. But though the value of the practice was recognised in these districts, it was scarcely appreciated in other counties. The

true pioneer of the modern science of drainage was Smith of Deanston. His object was to discover some means of carrying off the surface water which stagnated on clay soils, rendering them cold and tenacious in wet seasons, hard and unworkable in dry weather. To this object he devoted a series of experiments on a small farm at Deanston, and, from 1834 onwards, made known to agriculturists his methods of drainage, which restored the prosperity of clay farms and enabled them once more to compete in productiveness with light, sandy, naturally drained soils. Among his most zealous and enlightened patrons was Sir Robert Peel.

JAMES SMITH OF DEANSTON, BY R. ANSDELL, R.A.
*(Royal Agricultural Society.)*

His principles are now so universally accepted that they hardly need discussion. The soil cannot retain by attraction more than a certain amount of water. Of the remainder it must rid itself either by evaporation or by superficial discharge. If the land rids itself of surface water by evaporation, the temperature of the soil is chilled. A wet cloth wrapped round a bottle in hot weather acts as a refrigerator. The same effect is produced on the soil by evaporation. If the rain runs off the surface of the soil without penetrating, the soil is impoverished by the loss of one of its most fertilising agencies, for rain not only carries the heat downwards by penetrating through the surface, but also enriches it with its own nutritive elements. Nor is this all. A superficial discharge of rain-water carries off the natural fertility of the soil, as well as the artificial products used for its enrichment. Thus to the clay-farmer rain

was an enemy rather than a friend. His undrained land was either saturated with water in a wet season, or baked to a brick by the sun, or bound in a coat of iron by a frost.

Smith's object was to draw the water through the soil by means of deep drainage, to enable the rain to penetrate, to admit the air, and thus to change the texture of the soil by communicating to it that divisibility and mellowness which farmers call friability. Drainage, thus practised gave the farmer more days on which he might work his land, increased the efficacy of his tillage, and doubled the value of his manure. It gave him an earlier seed-time and secured him an earlier harvest; it raised the productiveness of the soil and lessened the expense of working it. Within a few years after Smith of Deanston made known his system, other improvements demonstrated the value and facilitated the application of his discovery. Josiah Parkes (1843) brought his practical and scientific knowledge to bear upon the subject. The cylindrical pipes of Reed (1843) and Scragg's machine for their construction perfected the means of drainage. In 1846 Parliament provided loan facilities, which enabled prudent landlords to drain their estates without imposing upon them an impossible burden of interest upon borrowed capital.

**Manuring.** The boon of improved drainage was especially valuable to tenants of clay farms. New manures assisted all farmers alike, whatever the nature of the soil. When agriculture was in its infancy little attention was paid to manure, though its value was recognised in the retention of manorial rights of folding. Many of the best of early agricultural writers hardly mention the subject at all. Markham, Plat, Lord Bacon, and Hartlib appreciated the value of manure, but they knew only of natural substances. As a rule, a little half-rotted straw was the only fertilising agency employed. "Nothing like muck" was a proverbial saying when only muck was available. With this exception, seaweed on the sea-coasts, the sweeping of streets in the neighbourhood of towns, salt, urine, marl, bones, bone-dust, ashes, and soot, were almost the only resources of the agriculturist. Now, however, science discovered new means of enriching the soil. The attention of men of science was directed to the different properties of the soil, and to the restoration of those qualities which the various crops exhausted. Sprengel

1846]

and Liebig led the way in the study of agricultural chemistry. From 1835 onwards the use of nitrate of soda and guano gradually spread. The manufacture of British guano supplied a cheaper and hardly less valuable substance than its Peruvian rival. In 1840 Liebig recommended, and in 1843 Sir John Lawes obtained, superphosphates of lime by dissolving lime-dust in sulphuric acid. Geology contributed its quota. In 1843 Professor Buckland and Professor Henslow proved that coprolites similarly dissolved, would produce the necessary superphosphates, and provided a new industry and new sources of wealth for such a county as Cambridgeshire. Eight years later, Odams (1851) demonstrated the value of the blood and refuse of London slaughterhouses in fertilising the soil. The use of phosphatic and ammoniacal manures revolutionised the old rules of cropping. So long as prices were high enough to support the expense of the new fertilisers, land was able to bear without exhaustion the strain of successive corn-crops. Nor did the value of manures stop here. The new agencies stimulated not only produce, but drainage; manures and thorough drainage acted and reacted upon one another: the first encouraged the second, and the second demonstrated the value of the first. Some idea of the increased use of manure and of the stimulus which it gave to farming may be gathered from the facts that in 1814 the declared value of bones imported into this country was only £500, in 1837 it was £255,000: in 1815 the quantity of rape cake and linseed cake was only 16,000 cwts., in 1837 it rose to 800,000 tons; in 1841 the guano imported was only 1,700 tons, in 1847 it was 220,000 tons.

Increased Yield.

Though prices fell, farmers found a substitute in the increased produce which resulted from manure, subsoil ploughing, drainage, and other improvements effected by the union of science with practice. Before Mr. Pusey's Committee on Tenant Right (1848), a Lincolnshire tenant was asked what was the increase in produce on his land, which resulted from improved farming. "The increase," he replied, "has been from almost nothing to 32 and 36 bushels an acre. It was formerly little more than a rabbit warren, only thirty-five years ago." Other instances, equally striking, might be cited to prove the enormous advance which farming made during the first half of the present century.

J. E. SYMES. The Social Economy.

THE Factory Act of 1833 was the first important step taken towards the reorganisation of industry by legislation after the Industrial Revolution had overthrown the old organisation. Hitherto the working classes had gained little by the series of inventions and discoveries which characterised the half-century before the Reform Bill. The wealth of England had been doubled; but the wages for most kinds of labour had hardly, if at all, increased; and the conditions under which the work was done had in many respects deteriorated. The rapid flow of labour to the great centres of industry had aggravated the badness of the dwellings of the poor, and had led to much overcrowding. The increased employment of children was largely due to the fact that mechanical inventions had opened out new means of utilising child labour. Employers soon found that children could do much of the factory work; and children were plentiful at a penny a day. They were often swept into factories when they could hardly walk. The Poor Law authorities of London began carting off waggon loads of pauper children to Lancashire. As the population of the manufacturing centres of the North multiplied, the demand for little London paupers fell off. The workmen were driven by poverty or greed to send their own children to work in the factories, and thus, in the long run, to beat down their own wages, by the competition of their own children. Many of them hated the necessity, and some saw that they were really injuring their own class. But what could a man do but imitate his neighbours? His own wages were, perhaps, a shilling a day. His half-dozen children could add fifty per cent. to this; and it was almost impossible to feed them otherwise. Children of eight, seven, or even six were frequently employed in factories. It needed more than average enlightenment and self-sacrifice to keep them at home or at school till they were nine; and the poor little mites often had to work twelve or thirteen hours a day. The condition of many of the factories was disgusting. The atmosphere was often abominable: the moral atmosphere sometimes worse. Children of both sexes were growing up in a sort of slavery, broken in health and brutalised in mind.

Factory Legislation.

Earlier Acts of Parliament had slightly, but only slightly, modified this terrible system. In 1816 the labour of children in *cotton* mills had been restricted to twelve hours a day. A

1846]

few years later a further reduction of three hours on Saturdays had been enacted. But these measures only applied to a single industry; and the work of unfortunate children, who were employed in other kinds of factories, was not even confined to sixty-nine hours a week.

In the Unreformed Parliament Michael Sadler, an extreme Tory, proposed to limit the hours of child labour to ten hours a day. The House referred the question to a Select Committee, whose investigations disclosed a state of things which few educated people had previously realised. To say that children of nine worked twelve hours a day conveyed to the leisured classes no very definite impression. But now doctors of eminence had shown to the Committee that it meant a physical and moral degradation of the mass of the English people; that the next generation was growing up with distorted limbs and weakened lungs—without hope, or joy, or innocence. In the general election which followed the Reform Bill, Sadler was defeated for the newly enfranchised borough of Leeds by young Macaulay, himself one day to be an eloquent defender of Factory Legislation. But Sadler had made inevitable what was to be one of the most important of the Bills of the Reformed Parliament.

Sadler.

MICHAEL SADLER, M.P.
("Fraser's Magazine," 1835.)

The place of Sadler was taken in the new Parliament by Lord Ashley, afterwards known as Lord Shaftesbury. He proposed that the work of children under nine in factories should be altogether abolished, and that those under eighteen should not be allowed to work more than ten hours daily. Government inspectors were to be appointed to enforce these regulations, and to see that the children had some education. The manu-

Lord Ashley.

facturers declared that if Ashley's measure were carried, English trade would be ruined; that they could only just hold their own, as things were, against foreign competition; and that under the proposed restrictions, they would certainly be beaten by countries where the work of children was freely allowed. The manufacturers were very powerful in the Reformed Parliament, and many independent members were impressed by the gloomy prophesies of those whom they regarded as experts. The Whigs, who formed the majority of the House, were much under the influence of the dominant political economists, who were preaching the doctrine of leaving trade to the operation of free competition. So the matter was again referred, this time to a Royal Commission. This Commission practically confirmed the report of the Select Committee. Nevertheless, the manufacturers in the House succeeded in reducing the age for the ten hours' limit from eighteen to thirteen. Thereupon Ashley threw up the Bill in disgust.

**The Act of 1833.**

The Government felt, however, that they could not let the matter drop, in the face of the two reports. They introduced a Bill of their own, more moderate in some respects than Ashley's, but in others going even further than he had proposed. Children under thirteen were now to be limited to eight hours' work daily. Young persons between thirteen and eighteen were not to work more than sixty-nine hours weekly. The Act was passed, and British trade was not ruined. In fact, the following years brought a great increase in our exports, and a slight rise in manufacturing wages. It would be unreasonable to attribute these results to the Factory Act. The fruits of that measure cannot have ripened so rapidly. But at least the prosperity of 1834 shows that the fears of 1833, even for the immediate future, were unfounded; and in the long run the country undoubtedly gained, even in purely material wealth, by the improvement in the health and strength of the labouring classes; so that the measure, which brought comparative ease and joy into many young lives, had not even to be paid for by diminished production.

**The Poor Law.**

The next important reform in our economic history was the Poor Law of 1834, which probably did as much for the rural poor as the Factory Act did for the factory workers. As lately as 1796 England had adopted a system which, in less than

1846]

forty years, reduced almost all agricultural labourers to a position of pauperism. The system was well meant. It endeavoured to mitigate certain evils growing out of the Industrial Revolution. Agricultural labour is naturally most in demand during the summer. But certain improvements in machinery deprived agriculturists of what had been one of their chief winter employments, viz. thrashing corn with flails. It was, therefore, thought desirable that the parish should supplement winter earnings,

LORD ASHLEY, SEVENTH EARL OF SHAFTESBURY.

(*After James Slater.*)

and the same principle was applicable to the summer, when wages were exceptionally low. Again, it seemed clear that a man with a large family needed more help than a bachelor, or a man with few children. Accordingly the parish help was made to vary with the number of mouths to be filled. It is evident that the motives for thrift, industry, and enterprise were seriously checked by a system under which the parish was to guarantee what is now called "a living wage." Moreover, if an allowance was to be made for every child, early and improvident procreation was encouraged. Again, if the ratepayers were to be subjected to such a burden, they would have less to spend in wages, and persons who would otherwise find remunerative

employment would be driven to apply for doles to the parish. All this actually took place under the "old Poor Law." Thrift and industry and enterprise were discouraged. The population was increased with a general disregard of parental responsibility. Poor rates rose at an even greater pace, and an ever-growing proportion of the agricultural labourers became paupers. Whether these results might have been prevented by wise and honest administration of the old Poor Law is questionable. But the actual administration was entrusted to people who were neither wise nor honest. Employers voted doles to save in wages. In other words, they got their work done partly at the expense of the parish. Shopkeepers voted relief in kind, which would bring custom to themselves or their friends. Staunch churchmen would proportion relief to professions of piety or marks of respect to the parson or squire. It was natural that rates should rise rapidly, and indeed it was calculated that in eighty years they multiplied by nine.

**Commission of 1832.**

A Commission was appointed in 1832, whose report revealed facts as deplorable as those which the Factory Commission reported. They recommended that out-door relief to able-bodied men (except in the form of medical aid) should be abolished, and that a central Board should sit in London with power to exercise a general control over the local authorities. There was a great outcry from charitable and well-meaning persons, who were shocked at the idea of depriving the poor of their accustomed doles. Others denounced the proposed Board as destructive of local liberties and independence.

**Poor Law Reform, 1834.**

But the case of the Commissioners was so strong that the Government introduced a Bill founded on their recommendations, and carried it through Parliament by overwhelming majorities. The second reading in the Commons was voted by 319 against 20, and such amendments as were carried in either House left the main principles unimpaired. Parishes were now grouped together in Unions, with Boards of Guardians to administer relief for the whole Union. Such bodies were far less likely than the old parish overseers to be animated by selfish local or personal motives, but they were also placed under the control of a Government Department. Out-door relief for the able-bodied was not absolutely prohibited. It could be given in the case of persons over sixty years of age, or in

1846]

whose family there was sickness. But even in such cases the Guardians were not bound to give out-door relief, and later legislation has further discouraged their doing so. The general rule was to be that an able-bodied man not able to support himself and his family should only be offered the workhouse. In many cases this rule worked harshly, and it provoked much indignation. But on the whole it has been justified by its results. The poor rates fell from seven millions in 1832 to four millions in 1837, and, what was more important, the proportion of paupers in the population steadily diminished. In districts where poor relief had been applied for as a matter of course in winter and in hard times, a more independent spirit grew up, and pauperism came to be looked on as a reproach.

Trade Unions, 1832-1843.

In the period dealt with in this chapter Trade Unionism made comparatively little progress No doubt in the earlier part of it a large number of new unions were formed, especially the Builders' Union, which embraced all branches of the building trade (joiners, masons, plumbers, painters, plasterers, etc.), from all parts of England. But the unionists had not yet learnt the importance of making their organisations purely business trade organisations. They got mixed up with political and philanthropic propaganda, with Owenism, Chartism, and the general promotion of the brotherhood of man. The attempt to federate disconnected trades was greatly stimulated by this tendency. In 1834 Owen started the "Grand National Consolidated Trades Union," which included, besides the ordinary unions, a variety of lodges (female and other). The constituent societies were each to have their own funds, but levies were to be made by the whole consolidated union in the case of strikes. Schemes for leasing land and starting co-operative workshops were part of the programme. Within a few weeks 500,000 members had joined, and a number of weak unions had been called into existence. The upper and middle classes were seriously alarmed, and in March, 1834, six Dorchester labourers were sentenced to seven years' transportation for having illegally administered an oath. The Grand National Consolidated rushed to the rescue, and organised a monster demonstration in London, which was attended by 30,000 people. But it achieved little, and the unions wisely dropped the habit of administering oaths.

The provision for strike levies proved the ruin of the Grand National. The members were not disposed to pay for strikes of whose merits they might know nothing. The depression of trade in the years 1836–40 helped to weaken the unions, and the energies of the more active leaders were drawn off towards Chartism. But a revival of trade changed the situation. From 1841 to 1843 Chartism dwindled, and Trade Unionism grew stronger. In 1841 the Miners' Association of Great Britain and Ireland was formed at Wakefield. Its membership rose to

TRADE UNION CARD OF THE CORDWAINERS
(*The London School of Economics and Political Science.*)

100,000, and at one time it employed fifty-three missionaries to disseminate its principles. Other societies were formed on a sound basis, and the agitation against the legal restrictions which still hampered Trades Unionism was vigorously pushed. The sick and benefit side of the organisations was developed, and counsels of moderation began to prevail.

Robert Owen.

The influence of Owen contributed to this, and indeed there were hardly any of the labour movements of our period in which this remarkable man did not make himself felt. From about 1790 he had been engaged in the cotton industry. The raw Welsh youth gradually rose to be a manager, and ultimately inherited his employer's business. The men under him were soon distinguished in character and efficiency, and Owen attributes much of his success to the fact that he

attended specially to the "living" and not merely to the "dead" machines. He refused to employ pauper children; he started schools where the children of those under him should be educated (and that by new methods, and especially by kindness) till they were twelve years old, before which they might not be taken into the mills. He provided stores

ROBERT OWEN.
(*After W. H. Brooke.*)

where his men could buy good things at a low price, and generally acted in the spirit of a paternal despot. The New Lanark Institutions became so famous that from 1814 to 1824 they were visited by 2,000 persons annually. The future Czar, Nicholas, was one of the visitors, and talked of founding a New Lanark in Russia. The exiled Napoleon is said to have been converted to Owen's views, and the Royal Duke of Kent was at the head of a committee for promoting them. Owen made a considerable fortune by his rare combination of ability and far-sighted benevolence. Gradually, however, his views took a more democratic turn.

In 1825 he bought up a village—"Harmony"—in America for £30,000, and tried to run it on semi-Communistic principles. If Owen had ruled it, there is no saying what the result would have been: but he left it to rule itself, and the scheme was a complete failure. The same thing happened with other similar schemes tried by his disciples. In 1829 he retired from business, and devoted himself to Socialistic propaganda. He started various papers, and delivered innumerable lectures. He opened in 1832 the Equitable Labour Exchange, a curious attempt to enforce, by means of a currency of "labour-notes," the theory that only the products of equal labour might fairly be exchanged for one another. Co-operative schemes absorbed much of his attention, but here, as in Trade Unionism, his Socialistic and philanthropic convictions tended to divert the movement from the comparative limitation of objects and methods, which proved to be the path by which it was ultimately successful. Meanwhile he had undoubtedly done much to stimulate thought and effort. His very failures were more useful than most people's successes, and especially he succeeded in fixing in the minds of large numbers of thoughtful people that men and women are the most important elements in national wealth, and that co-operation is more important than competition in producing even purely material prosperity. The partial realisation of some of his co-operative ideas must be postponed to our next chapter.

TRADE UNION CARD OF THE CURRIERS.
(*The London School of Economics and Political Science.*)

Owen always opposed violence, and had not much belief in State interference. He relied chiefly on voluntary combination and individual initiative. But the Radicals mostly thought that the condition of the poor could be improved by legislative changes, and many of them were even willing to appeal to force. From 1838 the so-called People's Charter became the authorised programme of the party. It was the old Radical creed: Manhood Suffrage, the Ballot, Annual Parliaments, Paid Members, Equal Electoral Districts, and the Abolition of all Property Qualifications. Several of these six points have since been conceded, and it is possible that they might all have been granted in 1838 without serious injury. But the danger of the situation lay in the wide-spread misery and discontent which was at the root of the movement. The abolition of the old Poor Law (with its lavish out-door relief) had roused much bitter feeling. The Reform Act of 1832 had admitted the middle classes to power, and they were legislating in their own interests. It was hoped that if the lower classes were allowed to share power, they would be able to use it to improve their condition. The danger was lest they should make legislation a means of plundering the rich. What measures they wished to pass when they had got the power was by no means clear. Many of the Chartists certainly wished to relax the provisions of the new Poor Law. Others advocated more pronounced Socialistic proposals. The leader of the Chartists, so far as they had a leader, was Feargus O'Connor, a typical demagogue of great physical prowess and considerable oratorical gifts. He afterwards went out of his mind, and he never displayed much intelligence. But among the less prominent Chartists were many men of real ability, mostly enthusiastic young workmen, self taught, but often better educated than the so-called educated class. Newspapers, meetings, violent speeches, and arrests followed. At length, in November, 1839, there was what might almost be called a rebellion at Newport in Monmouthshire (p. 159). The rioters were suppressed by the military. Smaller riots took place elsewhere. But it was soon seen that the number of Chartists in favour of physical force, and willing to risk their lives in armed rebellion, was insignificant. The panic passed away, but not the discontent. It smouldered on, varying in intensity with the

Chartism.

popular distress and other contingencies. Socialism, Secularism, Teetotalism, Trade Unionism, Co-operation, Vegetarianism, and other movements got mixed up with Chartism in some degree. But its main factor continued to be a bitter sense of injustice and misery, with a conviction that the rich were in some way responsible. The upper and middle classes repaid hatred with hatred, and generally regarded the Chartists as brutal and desperate men, coveting the wealth of others, without belief in God, and without reverence for their social superiors or the rights of property.

"Young England."

There were, of course, many of the well-to-do who sympathised with the sufferings of the poor: and in 1843 what was known as the "Young England" party attracted considerable attention. Disraeli had begun as a Radical, but with some leanings towards Toryism. The patriarchal system, with benevolent landlords and loyal peasants bound together by mutual obligations, was the fascinating ideal which he put forward: and he persuaded various well-meaning young nobles and squires to join him in an effort towards realising it. The movement came to little, but it deserves mention as the most prominent of the attempts to remove Chartist grievances without democratising our institutions.

The Corn Law Agitation.

Meanwhile a powerful agitation was to some extent diverting attention from Chartism. This was the movement against the Corn Laws, which was to a great extent a middle-class agitation, in which rich manufacturers and merchants played an important part The Chartists were divided on the subject. Some of them believed that a reduction of the tax on bread would be followed by an equivalent fall in wages; and even those who were convinced Free Traders generally looked with some coldness and suspicion at what they considered essentially a middle-class agitation, and one which they feared would distract popular interest from the People's Charter. Nevertheless, the movement spread rapidly. Thousands of pamphlets were circulated by the Anti-Corn-Law League, which had been formed in September, 1838. Gigantic bazaars were held to recruit its funds. One of these raised £20,000. A Free Trade Hall rose in Manchester, at the place which had been the scene of the Peterloo massacre. The Penny Post and the spread of railways enabled the agitation to grow to

dimensions for which there was no precedent. The big towns in the North of England, now enfranchised by the Reform Bill, were warmly on its side, and it secured two remarkable leaders. Richard Cobden had risen from a humble position to a moderate competence in a Manchester business, and had acquired some fame as a writer of political pamphlets when he threw his chief

FEARGUS O'CONNOR.
("*The Labourer*," *Vol. II.*)

energies into this movement, for which his qualities were specially suited. He was not a great orator, still less a special pleader, but he had a great skill in marshalling the facts which had convinced himself, and in appealing to common sense. John Bright, on the other hand, was pre-eminent as an orator, whose passionate convictions warmed up a simple style and an appearance of self-restraint. He was a master of pathos, of humour, and of scorn, well fitted to rouse the feelings of those whose understandings had been convinced by Cobden, and of

many who could not appreciate the logical force of the Free Trade arguments. By 1842 the league had become a great power in the country. But their prospects in Parliament did not seem very brilliant. The Tories with their sliding scale, and the Whigs with their fixed duty, were almost equally opposed to the policy of complete abolition of Corn Laws. A Free Trade motion, in 1842, only secured ninety votes in the House of Commons against 393, while in the House of Lords it was rejected by 109 to five. Nevertheless, the Budget of 1842 showed how far Peel was prepared to go in the direction of Free Trade. A new and much modified sliding scale was adopted, under which (to give a single instance) the duty on wheat would be reduced from 36s. 8d. to 20s. when the price was 50s. This was followed by the modification or abolition of the customs duties on 750 kinds of articles. The loss to the revenue was to be made up by an income tax. In fact, Peel was already convinced that Free Trade was the sound principle. But he still persuaded himself that an exception should be made in the case of corn.

**Peel's Tariff Reform, 1842.**

**The Corn Laws Repealed, 1845.**

The Irish famine of 1845 completed the conversion of the leaders on both sides to the abolition of the Corn Laws. It was absolutely necessary to open the ports freely to all kinds of food, and if they were once opened it was not likely that the nation would tolerate a return to dear bread. The Whig leader, Russell, wrote that Protection was "the blight of commerce, the bane of agriculture, the source of bitter division among classes, the cause of penury, fever and crime among the people." The Conservative Premier proceeded to announce his conversion (January, 1846), and managed to carry with him all but one of his Cabinet. Mr. Disraeli sprang into sudden prominence as the leader of a Conservative revolt, but the abolition of the Corn Laws was sustained by 327 to 229 in the Commons, and by 211 to 164 in the Lords. This was followed by an increase of national prosperity, particulars of which will be given in the next chapter.

**Financial Crisis, 1836-37.**

We must now turn back to briefly describe the financial crisis which marked the years 1836–37. The excellent harvests of 1833, 1834, and 1835 lowered the price of wheat, and thereby caused much agricultural distress: but other classes of the community gained by the fall, and both manufactures and

1836]

commerce were considerably stimulated. As usual there followed an unwise amount of speculation, especially—this time—in railways and foreign loans. There was also a great extension of the joint stock banking system, which further economised capital and lent facilities for undue, as well as for legitimate, credit. The accumulating capital was seeking everywhere for remunerative openings. Several hundred companies were formed with a nominal capital of two hundred millions of pounds. Many of them were simply got up by speculators to entrap unwary investors. The climax was reached in March, 1836, when a contraction of credit and a drain of gold from the bank set in. The rate of discount was raised to 4½ per cent. in July, and to 5 in September. But still the drain continued. Bubble companies were bursting on every side, and the Bank of England decided no longer to discount bills endorsed by the joint stock banks of issue. A catastrophe followed. First, the Irish "Agricultural and Commercial" stopped payment (November 14th). There was a run on other Irish banks. Then many of the English banks found themselves in difficulties, and began pressing the Bank of England for loans. It advanced £1,370,000 to the "Northern and Central," and £6,000,000 to various American houses in London and Liverpool. It thus averted a repetition, perhaps on a larger scale, of the disasters of 1825 (p. 122 *seq.*). There were serious failures and much financial disturbance in 1836-37, and the bad harvests of 1838 and 1839 aggravated the depression. This was followed by another crisis. Nevertheless, the panics of these years fell far short in intensity of those of 1826 and 1847. They were mainly connected with the trade to America, India, and China, and only slightly interrupted the general industrial progress of the nation.

Bank Charter Act, 1844.

The crises of 1826, 1837, and 1839 were certainly partly due to the excessive credit given in the months immediately preceding the crisis. Peel was convinced that the danger of a recurrence of similar panics might be diminished by restricting one of the most obvious forms in which credit is given, viz. the issuing of bank-notes, which are in effect promises to pay. He, therefore, introduced his celebrated Bank Charter Act of 1844. From his speech it seems clear that if he could have made a fresh start, without regard to vested interests, he would have made the issuing of bank-notes

an absolute monopoly, and would have kept it in the hands of the Government. As things were, however, he proposed (1) to divide the work of the Bank of England into two distinct departments, one of which was only to issue notes, while the second was to discharge the other banking functions; (2) to limit the number of notes which the Bank of England might circulate to the amount of bullion in the Bank, together with £14,000,000, together with two-thirds of the amount that any bank which ceased to exist might previously issue; (3) to limit the amount that provincial banks might issue to what had been their ordinary note circulation, while the Scotch and Irish banks were to be in the same position, except that they might further issue notes up to the amount of bullion in their reserve; (4) to prohibit all London banks, except the Bank of England and all other banks that might be chartered after the Act, from issuing any bank-notes whatever. These were the most important provisions of the Act, of which it must suffice to say here that if it limited the giving of credit in times of undue speculation, it would also limit it at times when the public interest demanded that more credit should be given. But, of course, it was open to the Legislature to suspend the Act at such times, and we shall see that it has more than once availed itself of this remedy. On the whole, the measure may be described as a somewhat clumsy and characteristically English compromise, with perhaps an excessive regard for vested interests, and which certainly provided no adequate protection against crises and panics, but which, nevertheless, has had some practical utility, and avoided the dangers which a more logical treatment of the question might have involved.

Mines Act, 1842.

The principle of the Factory Act of 1833 was gradually extended. The more important of these extensions, during the period dealt with in this chapter, was the Mines and Collieries Act of 1842. The report of a Commission showed that children of six years were working in dark and unwholesome excavations, while women were employed on tasks for which their strength was inadequate, and by which their modesty might be undermined. It was shown that the population of the mining districts were deformed and diseased through the nature of some of their work. The chief provisions of the

THE FINANCIAL RECOVERY AFTER 1836.

*(From a contemporary satirical print.)*

Act will be found in our last section on mining (p. 752). It was introduced by Lord Ashley, and met with little opposition.

Summary. The period 1832 to 1846 was one of great legislative reform, but of slow material progress. The population advanced rapidly, but wages fluctuated, and only showed a slight upward tendency. On the other hand, pauperism was much diminished by the changed Poor-law, and commerce grew, in spite of the disturbances between 1836 and 1839. Capital also accumulated fast, and, though much of it was sunk in railways, etc., this was soon to bring in returns, of which in the long run the wage-earning classes were to secure a considerable share, especially as they got better organised in unions and better protected by factory and mining legislation. Finally, Free Trade was established, and the price of the necessaries of life began rapidly to fall.

ARTHUR GRIFFITHS. Prison Discipline and Prison Reform.

THE first great movement in philanthropy and prison reform began and died with John Howard (Vol. V., p. 656 *seqq.*). Prisons in England generally relapsed afterwards; efforts at improvement had been spasmodic, and were short-lived. Here and there, notably in the Eastern Counties, more intelligent and humane principles were observed; some attention was given to classification, cleanliness, and prison employments. But elsewhere the previous chaos supervened: overcrowding was so terrible that in some prisons the wretched inmates slept edgeways for want of room to lie flat; buildings were so unhealthy that infection stalked rampant, so insecure that shackles and fetters were made to supplement the want of walls. There was no separation between the sexes, and moral contamination flourished unchecked; chaplains were few and often without much zeal. The worst abuses prevailed everywhere, and this in spite of legislative enactment; for, to the credit of Parliament, many Gaol Acts had been passed; all aimed at securing reform, but the law generally remained a dead letter.

It was not till after the Peace of 1815 that the fresh remedies were applied. The chief credit is due to a small band of earnest workers, many of them Quakers, who formed themselves into a Society for the Improvement of Prison Discipline. One of its most active members was Mr. T. F. Buxton,

1846]

and among his coadjutors were such men as William Wilberforce, Macintosh, Scarlett, the Gurneys and Frys. A system of visitation was adopted to investigate and expose the most crying evils. It was now enunciated for the first time that the criminal in custody had certain rights: the right to be fairly treated, to be spared disease and the deterioration that must follow free intercourse with vile associates. Now, too, it was suggested that prisoners should be separated one from another, and the Society succeeded in forcing this view upon the Legislature. Through their untiring efforts new Gaol Acts, those of 1823–4, were passed, and in these many sound principles were laid down. Cleanliness and sanitary precautions were insisted upon; it was ruled that every individual should have a hammock or cot to himself; regular labour was recommended for all; chaplains, schoolmasters, matrons for female prisoners were appointed.

Gaol Acts, 1823-24.

Yet progress was strangely slow. The new laws were evaded or ignored. The cause of reform was impeded by the misplaced ridicule of retrograde people who denied the existence of such flagrant evils, and sneered at the ultra-philanthropists. It was asked whether Turkey carpets were also to be provided for the prisoners' cells. Even Sydney Smith sharpened his wit upon humanitarianism run riot, and declared that if the Prison Society had its way in pampering criminals, prisons would cease to be a salutary terror to evil-doers. The Society's answer was to hold on in its course with undiminished energy and singleness of purpose. Its members never faltered in their self-imposed task. It was herculean; the multiplicity of prisons, their diffusion over a wide area, each under an independent and often most apathetic jurisdiction, greatly hindered examination or control. The worst prisons were those of the corporate bodies, and of these Newgate was pre-eminent as the narrowest, foulest, most debasing and defective in the length and breadth of the kingdom.

The next great move was made in 1835, following the severe strictures of a Committee of the House of Lords, who denounced the hydra-headed evils still existing in prisons. The recommendations in this report all made for improvement; but its most interesting feature was its unhesitating acceptance of the principle of entire individual separation; in other words, of that rule of "separate confinement" which has been adopted, at least

The Cellular System.

in theory, throughout the civilised world. As to recommendations and even enactments, none were likely to be observed unless steps were taken to insist upon it. For this purpose two inspectors of prisons were appointed, officials and experts whose first duty was to watch over the progress of reform. These gentlemen, with praiseworthy and fearless zeal, now commenced a crusade which won them some obloquy, but was productive of immense good. Their first report, dealing only with Newgate, which they condemned in the most trenchant and unsparing terms, attracted universal attention. Public opinion was at last aroused. It was deemed a disgrace that such horrors should survive "the denunciations of authority, in contempt of religion and humanity, and in defiance of the law." The general interest was kept alive as year after year the inspectors continued their exposures. Parliament once more interposed, re-affirming the principle of separation, and urging the local authorities to build new gaols with a sufficiency of separate cells. It went further, and in order to stimulate effort and provide an example for general imitation, proceeded to erect Pentonville Prison, then and still known as the "model." It is an enduring tribute to the far-seeing judgment of its projectors; for this prison as it stands to this day, with its tiers of cells in buildings radiating like the spokes of a wheel from a common centre, is still the best type of prison construction, and has been generally adopted all over the world.

The Government lead was quickly followed, and within a few years of the completion of Pentonville, fifty-four new prisons were built in various parts of the country. The system of cellular confinement was adopted in all, and now when prison discipline had become the question of the hour, there was much controversy, many conflicting opinions, as to the best kind of prison treatment. Some were in favour of unbroken silence and continued isolation; others supported labour in association, with separation at all other times. To-day, after much debate and experiment, the question has been settled by using a modification of both systems. Separation is enforced for short terms: in penal servitude sentences which range from three years upwards it is limited to the first nine months' imprisonment, the remainder being passed in associated labour on public works.

Milder Penalties.

We have dealt so far with the amelioration introduced into gaols, the receptacles of the unconvicted, the debtors, and the least heinous offenders. But the prison pure and simple was the ante-chamber only to graver punishment and a more gruesome penalty. While reformers were busy with prisons these other methods called also for change. Until 1838 penal

THE LOCK-UP HOUSE, BY GEORGE CRUIKSHANK
(*From "Sketches by Boz," by Charles Dickens, Vol. II.*)

exile, or transportation beyond the seas, was still the rule for all great criminals, and many small ones, who escaped the gallows. But the year that saw the condemnation of the one saw also a marked diminution in capital punishments. A more merciful spirit had at last prevailed in reducing the blood-thirstiness of our criminal code. Men were no longer to be hanged out of hand for trivial offences. In 1832 the death sentence for forgery, coining, horse- or sheep-stealing was

abolished, as well as for stealing a post-letter or for sacrilege. Lord John Russell swept away many capital offences in 1837, with the result that where in that year there had been 438 executions, the number in 1839 had fallen to 56. Within a couple of years it came to be understood that capital punishment should be the penalty for murder alone—that a life for a life was all the law could exact. With this progressive amelioration of the code many old and barbarous practices disappeared. Traitors were no longer disembowelled after execution, nor were the bodies of hanged malefactors handed over to hospitals for dissection. Many more years were to pass before one great remaining blot was expunged from our criminal procedure. It was not until 1868 that executions in public ceased; till then the disgraceful scenes before the gallows were constantly re-enacted, and thousands of all classes, high and low, flocked to witness and gloat over the sufferings of a dying fellow-creature.

Transportation.

Many causes contributed to discredit transportation. Although the new countries, which it had in a measure created, refused at last to continue to be the receptacle of our social sewage, the system survived for some years longer in Crown colonies, although generally condemned in principle. The objections raised to it seemed logical and conclusive. It was, in the first place, inordinately costly; it was unequal in its incidence; and it entrusted to private persons the charge and discipline of those who were the prisoners of the State. Many of those it intended to punish found large fortunes in their exile, and the climax of absurdity was reached when emigration agents crying up the Australian El Dorado found competitors in the Law Officers who were franking the dregs of society to the same favoured spot. After the gold discoveries the paradox necessarily exploded.

MARY BATESON. Social Life.

At the time of the queen's accession the favourite form of dress was a wide skirt of seven or eight breadths, lined with stiff muslin, over which was worn a tunic of another colour. Vivid and inharmonious colours were fashionable, and a well-dressed lady is described as wearing a blue satin robe, black-violet mantelet lined with blue satin and trimmed with black lace, and

DRESS WITHOUT ART, 1830.
("*The Court Magazine.*")

an emerald green hat trimmed with blond and roses, as well as ribbon and feathers. A lady without a silk dress felt she had lost her self-respect. In 1824 the prohibition on foreign silks, long rendered almost nugatory by smuggling, was withdrawn, and subsequently the *ad valorem* duty of 30 per cent. on foreign silks was reduced to 15 per cent., and ultimately abolished. Early Victorian Dress.

MR. PERKINS DISCOVERED IN THE ZOOLOGICAL GARDENS.

(*From the drawing by M. A. Tidmarsh, in "Comic Tales and Sketches," by W. M. Thackeray.*)

The dress of children of 1840 will not be forgotten while Thackeray and Dickens are read; the little boys who wore nankeen trousers, white waistcoats, green coats, frilled shirt collars turned open over the shoulders, white stockings and pumps, and the little girls dressed at all hours and in all seasons in low-necked, short-sleeved frocks, with their hair in pig-tails, their legs in frilled trousers and white socks, and their feet in sandals.

Scott writes in 1818: "No man of experience will ever expect the breath of a Court to be favourable to correct morals. Half of the mischief is done by the publicity of the evil which corrupts those who are near its influence." In twenty years the accession of a young queen and her marriage to a man of singu- The Court

larly pure and earnest disposition, produced a remarkable change of tone. In 1841 Sir Robert Peel was seeking for men of high character and good education to become officers of Prince Albert's household. Writing to Lord Ashley, afterwards Lord Shaftesbury, he explains that he offers him a place because he must find "men of unblemished character." Ashley, indeed,

CHILDREN IN 1836, BY GEORGE CRUIKSHANK.
("*Sketches by Boz*," by Charles Dickens, *Vol. I.*)

believing that the offer was made to silence him, was not well pleased, and records that a certain Lord—"the hero of Madame Grisi"—had already had the offer of the Vice-Chamberlainship, but refused, saying, "Thank God, my character is too bad." Whatever may be the true explanation of the offer, there is no doubt that a change had come. Lord Melbourne, in a fit of temper, cried out "This damned morality will ruin everything"; but at a quieter time he would probably have acknowledged

that the queen's influence was as good for him as his knowledge of the world was useful to her.

QUEEN ADELAIDE, BY SIR W. BEECHEY, R.A.
(*By permission of the Elder Brethren, Trinity House.*)

Greville, describing the Court of 1838, says it is not gay, there is none of the sociability of a country house, "little trouble, little etiquette, but very little resource or amusement."

After the days of George IV. the pomp of the coronation and the display at Court entertainments greatly diminished. The coronation of George IV. cost £243,000, of William IV. £45,000, of Victoria £70,000. William's queen was so anxious that no expense should be incurred on her account, that she would not permit either the purchase or hire of a crown from Rundell's for her, but ordered that it should be composed of her own jewels, and made up at her own expense. At George IV.'s coronation Rundell's charge for the loan of jewels was £16,000.[1]

The last of the birthday balls, which recur so frequently in eighteenth-century journals, was given on the Princess Royal's eighteenth birthday. Strangely in contrast with times past is the entry which Lady Bloomfield made in her diary (1842) when she was maid-of-honour to the queen: "No one dined here last night, so we played at vingt-et-un, and I won eightpence."

Duelling.

In the twenties of this century there was no sign of any change of feeling with regard to duelling. The duel of the Dukes of Bedford and Buckingham (1822) in Kensington Gardens, was one of an ordinary type. Both fired in the air, and the Duke of Buckingham said, "My Lord Duke, you are the last man I wish to quarrel with, but you must be aware that a public man's life is not worth preserving unless with honour." His adversary answered, that upon his honour he had meant no offence to the Duke of Buckingham, and the matter ended. But in 1819, the Duke of Wellington's duel with Lord Winchilsea was generally acknowledged to be a mistake. Lord Winchilsea had opposed the founding of King's College, London. Wellington, as Prime Minister, supported it, and sent a challenge on the ground that Lord Winchilsea had declared the scheme to be in support of Popery. It was recognised that the Duke of Wellington's reputation for honour, courage, and zeal for the Church needed no challenge for its protection. In 1830 two judges declared the survivor in a duel to be guilty of murder, and in 1833 the seconds were declared to be involved: but while juries were willing to convict principals, only one jury convicted seconds. Already the middle classes were beginning to show pronounced hostility to what was considered an aristocratic abuse, or a crime which was only condoned because the accomplices were gentlemen. The practice of constant duelling between members of

[1] Raikes, "Journal," vol. i., p. 11.

THE QUEEN RECEIVING THE EUCHARIST AT HER CORONATION, JUNE 28, 1838

*(After the painting by C. R. Leslie, R.A.)*

Parliament was seen to be an absurdity. Feeling ran high at the time of the trial of Lord Cardigan, who was tried as a peer by the Court of the Lord High Steward, on a true bill returned by the grand jury. He was acquitted on a technicality; but when it was found that captured duellists would run the risk, if they were peers, of heavy expenses, and if they were commoners of imprisonment, there was less eagerness to challenge. In 1841,

DUEL BETWEEN THE DUKE OF WELLINGTON AND LORD WINCHILSEA.
*(From a satirical print of 1829.)*

two brothers-in-law, both officers, fought, and one was killed. The War Office refused the dead man's widow a pension, and superseded the survivor, who had left the country. In 1843 the Prince Consort proposed a Court of Arbitration to decide affairs of honour, but the scheme fell to the ground. However, a society for the abolition of duelling was formed, and the desired object was brought about, mainly by the Articles of War of 1844, which enjoined officers to offer and accept apologies, and made cashiering the penalty of duelling. In 1845 Roebuck's treatment of his challenge from Somers helped to bring duelling among Members of Parliament to an end. Roebuck brought the challenge before the House as a breach of privilege, and Somers apologised.

1846]

About 1835 there was a strong recrudescence of Sabbatarianism. Sunday Cabinets and Cabinet dinners were no longer held, and other Sunday parties fell with them. When the railways began to spread, an attempt was made to stop Sunday travel, or at least to prevent third-class carriages from running. Roebuck wished to see the clubs, Hyde Park, and the Zoological Gardens closed, and sought vainly to impose a penalty

Sunday Observance.

THE HORSES' PETITION FOR THE OBSERVATION OF THE SABBATH.

(*From a satirical print of* 1833.)

on bishops or clergy caught in the act of driving to church. Sunday letters were stopped, but in the provinces a Sunday delivery was recovered. In 1856, on the defeat of the Bill for the Sunday opening of the National Gallery and British Museum, Greville writes: "Cant and Puritanism are in the ascendant, and it will be well if we escape more stringent measures against Sunday occupations and amusements. It is stated that the Sabbatarians are so united and numerous that they could carry any election!" and Palmerston found himself obliged to accede to the Archbishop of Canterbury's request, that in deference to public opinion, the military bands in Kensington Gardens and elsewhere should be silenced.

New and Old Puritanism.

But the Puritanism of the first half of the nineteenth century has not much in common with the Puritanism of a Stubbs or a Prynne. A book such as "Cobbett's Advice to Young Men and (incidentally) to Young Women" is in its own way an "anatomy of abuses," but the tone is greatly changed. His attack is on luxury, on self-indulgence, on the slavery of the *tea*, and *coffee*, and other *slop-kettles;* his harangue is on the injury to health done by pouring pints of *warm liquid matter* down the throat, whether under the name of tea, coffee, soup, or grog; on the accursed decanter, which "cries footman or waiting-maid, puts bells to the side of the wall, screams aloud for carpets." When people say to him, "Lord, *what* is a glass of wine?" he answers, "Everything: it is the pitcher of the key, it demands all the other unnecessary expenses." He allows dancing, but no cards, dice, or chess-boards under his roof. The theatre he thinks might be an influence for good, but it is not, and for a simple reason. Not a word is allowed on the stage of which the Lord Chamberlain, that is, the Ministry, does not approve. He enjoyed the theatre till he knew that, but he has never been again since. His is largely a Puritanism of party politics.

MARY BATESON. Postal Reform.

THE number of letters and postcards and newspapers sent by post in 1884 had multiplied between eleven- and twelve-fold since 1837, when Rowland Hill first proposed his reforms. The removal of the General Post Office from Lombard Street to St. Martin's-le-Grand in 1829 had made some improvements in organisation possible, but it was felt that the development of the Post Office had not kept pace with the commercial growth of the country. That the postal receipts were slowly diminishing, though the population had increased by six millions in the twenty years, 1815–35, was evidence enough that something was wrong. Repeated advances in the letter-rates were powerless to increase the revenue, for means were always found to defraud the Post Office. As the charge on the letter could not be paid by the sender, those away from home arranged codes of signals which should serve to tell friends at home of their safety and welfare. The poorest sent an empty envelope, which was regularly refused at the door. Rowland Hill used to underline words

in newspapers, the meaning of which was understood at home. A line under the name of a Whig politician meant that the sender was well; a line under the name of a red-hot Tory meant that the sender was dangerously ill. The price of letters outside London varied from 4d. for the smallest distance to 1s. 8d. for the longest. A letter of a single sheet, weighing under an ounce, sent from Birmingham to London, cost 9d. If there were any

*Photo Walker & Cockerell.*

SIR ROWLAND HILL, K.C.B., BY J. A. VINTNER.

(*National Portrait Gallery.*)

enclosure the letter was "double," and the charge doubled, though the weight were less than half an ounce; hence the practice of "crossing" letters. To ascertain whether there was an enclosure the Post-Office officials subjected every letter to a strong light, and were thus tempted to many malpractices. To evade the postal charges friends were made to carry parcels, proofsheets, letters; carriers made illicit posting a regular business, which occasional seizures and heavy penalties were powerless to check. From 1815–39 the net revenue was about one and a half million, and more than half a million was spent in

expenses of management. It was necessary not merely to weigh the letters and search for enclosures, but also to discover whether the letter had been written where it was posted, or had been carried part of the way to defraud the revenue. Each letter had to be marked at the destination with the amount of postage due; the postman must wait at each door to collect it; and as there were as many as forty possible varieties of inland rates, all this took time, and needed much office work. The principle which Rowland Hill's pamphlet on postal reform established was that the expense of a letter did not vary appreciably with the distance it was carried. He estimated the number of letters sent at 126,000,000, the proportion in the London district being 88,600,000 chargeable to 7,400,000 franked, and 30,000,000 newspapers, on which no charge was levied, as the Government stamp defrayed postage. He showed that with a total distribution of 126,000,000 and total cost of management nearly £700,000, the cost of primary distribution, namely from post-town to post-town, was about £426,000, of which only £144,000 was expenditure on transport, and the remaining £282,000 paid expenses which did not vary with distance. The average cost of a letter he estimated at $\frac{57}{100}$d. each, of which $\frac{28}{100}$d. was cost of transit, and $\frac{56}{100}$d. cost of delivery, receipt, etc. These figures he obtained by including the heavy franked letters and newspapers in the reckoning; whereas if these had been paid for, the expense would be still less—only $\frac{9}{100}$d.—for chargeable letters did not make up a half of the total mail. Judging by the average weight of the Edinburgh mail from London, he showed the cost of transit in that particular case to be $\frac{1}{36}$d. He argued then that since it was impossible to collect such minute sums as $\frac{1}{36}$d. it was absurd to make the expense vary with distance, and he advocated a uniform charge to cover by one payment the whole expense of receipt, transit, delivery, collection, etc., and that no uniform rate should be higher than the minimum then in use (in the London district 1d.). The scheme was warmly taken up by the trading community, and in one session 2,000 petitions in favour of it were sent in. In Parliament it was hotly opposed, not on the ground that correspondence would fail to develop in accordance with Hill's anticipations, but on the ground that it would develop to impossible proportions. Lord Lichfield ridiculed the idea that the Post Office could carry

THE GENERAL POST OFFICE IN 1832.

480,000,000 letters, and pictured the bursting of its walls. Hill answered that he never before heard of the man of commerce who dreaded the too great expansion of his business. In 1870 Lord Lichfield's impossible number was more than doubled, in 1884 more than trebled.

**The Penny Post.**

On January 10th, 1840, Hill's scheme for a uniform penny post was in operation. Franking was abolished, and in May, 1840, a scheme for prepayment by means of stamps was in force. Hill had anticipated a five- to six-fold increase in the number of letters, and was at first disappointed. Many of the schemes which he had proposed to secure better organisation were not adopted, and on the first year the loss to the revenue was a million sterling. The following year it was £900,000. Hill had desired a great extension of rural distribution, and an increase in the number of deliveries. In London letter-boxes were only open from 8 a.m. to 7 p.m. No day-work was done in the Post Office; all letters went of necessity first to St. Martin's-le-Grand, and it took on an average fifteen hours for a letter posted in London to reach another part of London. The execution of his plan, he says, was entrusted entirely to men whose official reputation was pledged to its failure, who rejoiced at the end of the first week of trial when the increase in the number of letters sent fell short of Hill's expectation. Yet in the first two years, in spite of difficulties, the number of chargeable letters rose from 75,000,000 to 196,500,000; the London district post increased from 13,000,000 to 23,000,000, or nearly in the ratio of the reduction of the rates, while the illicit conveyance of letters was suppressed without effort. Every year reduced the loss, and by 1849 the system was in good order.

**Later Post Office Developments.**

In 1857 the book-post, established in 1848 at the rate of 6d. per pound for one volume only, was reduced. In 1859 the Money Order Office was remodelled. It had been started in 1792 as a private enterprise by three post-office clerks, and was not made an official department till 1838. In the following year the amount of money sent was over £300,000, in 1884 it was over £27,000,000. This change was brought about by reducing the charges, which at first were at the rate of 1s. 6d. for all sums between £2 and £5, and at 6d. for all sums under £2. The charges for registration were at first similarly prohibitive, and were gradually reduced from 2s. 6d. to 2d. The

Post Office Savings Banks, opened in 1861, have proved to be of great social importance as a stimulus to thrift. In two years nearly 320,000 accounts had been opened, amounting to over £3,000,000. In 1882 the accounts numbered nearly 3,000,000, amounting to over £39,000,000. The encouragement of small investments in Government Stock, of the purchase of annuities and life assurances, had also become part of the work of the Post Office.

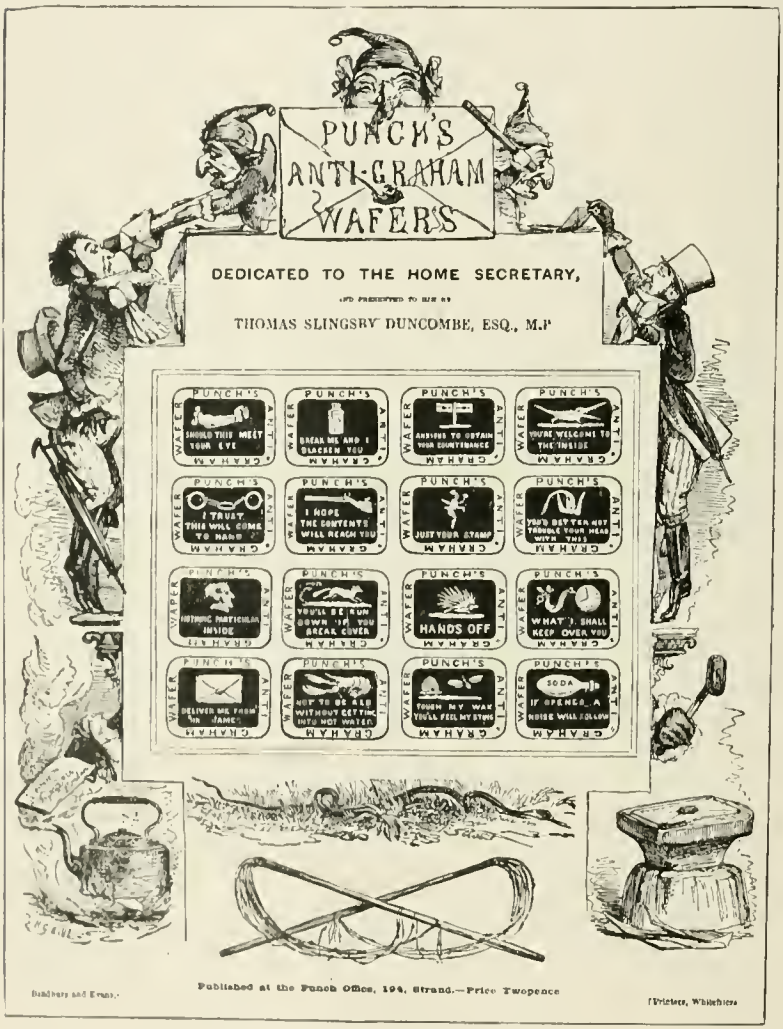
In 1860 the Post Office recovered control of the packet service, which since 1823 had been partly, and since 1837 entirely, in the hands of the Board of Admiralty. Postcards were first used in 1870, the year, too, in which telegraphy was made a function of the State. The daily average of telegrams was then 450; in 1883, 6,000, though the days of sixpenny telegrams were not yet come. In 1871 the half ounce of the penny post was raised to an ounce. The International Postal Union dates from 1874. In 1883 the Parcel Post began, and by 1885 many Parcel Post Conventions had been made with foreign countries.

In 1883–84 the total number of letters sent in the year was 1,322,086,900, of postcards 153,586,100. This gigantic development has been met by increased railway facilities and the use of railway sorting vans.

Envelopes and Stamps.

Considerable excitement was created in 1844 on the subject of letter-opening by Post-Office officials, and this led to the use of various forms of wafer and envelope intended to ensure secrecy. The origin of the stamp is involved in some obscurity. Stamped covers for newspapers were used experimentally by Charles Whiting in London under the name of "go-frees" in 1830; in 1834 Charles Knight, of the Stamp Office, recommended their use generally. In 1834 James Chalmers, a printer of Dundee, invented an adhesive stamp; and in 1837 Rowland Hill suggested that "little bags called envelopes" should be printed with a stamp and generally used, while small stamped detached labels, with a glutinous wash at the back, to be attached without a wafer, should be used under certain exceptional circumstances to frank the letters of those ignorant persons who found a difficulty in using the stamped cover. The design for the stamped envelope was drawn by Mulready (p. 64), and his "allegorical cover" gave rise to much amusement. In

the centre at the top sat Britannia throwing out her arms to winged Mercuries, and on either side of Britannia were groups




PUNCH'S ANTI-GRAHAM WAFERS.

*(Reproduced by special permission of the proprietors of "Punch.")*

of Eastern merchants, camels and elephants, missionaries and Red Indians. "On the right stands a dutiful boy reading to

his anxious mamma an account of her husband's hapless shipwreck, who, with hands clasped, is blessing Rowland Hill for the cheap rate at which she gets the disastrous intelligence." Vast numbers of this envelope were printed, but they met with no sale. The public would not take them at the "price of 1s. 3d. for the envelopes and 1s. 1d. a dozen for the sticking plaster." The first stamps were printed in black with the obliterating mark in red, but chemists discovered that the red could easily be washed out. It was only after many strenuous efforts that a matrix was produced which could bid defiance to forgers, and for long it was expected that servants would destroy letters in order to use the stamps, and that all leisured people would devote their time to erasing the defacement marks, or imitating the stamp. The first general issue of penny stamps of the once familiar brick-red form was made January 1st, 1841. In 1885 the issue of stamps for the year amounted to 114 tons.

JAMES COLVILLE. Scotland.

The first election under the Reform Bill introduced to the delighted gaze of burghers round their market crosses the novel sight of the hustings, and of candidates soliciting their votes. At Glasgow, instead of the old hole-and-corner meeting of four delegates to choose for thirty-three electors, over seven thousand new voters, in open day, had six candidates to select from and the excitement of a two days' poll. Jeffrey, who, as Lord Advocate, had drafted the Scotch Bill, was the hero of the hour when he was returned for his native Edinburgh. The capture of Mid-Lothian, citadel of the old party, was a still greater triumph. The entry of Earl Grey into Edinburgh for the Reform banquet (1834) was far finer than the reception of George IV. An improvised Aladdin's palace, glorious with the novel splendours of gaslight, re-echoed the oratory of the victors. A *Times* reporter posted up to London from the meeting in thirty hours. He left the hall at midnight of that Monday on which the meeting was held, and by midday of the following Friday the north mail brought the London newspapers with the report of the speeches.

The Triumph of Reform.

Burgh Reform, 1834.

The general awakening of the hour lent fresh impetus to a movement, now of half a century's growth, that struck far deeper into the roots of social life than Parliamentary reform.

The growth of cities and the rise of industry emphasised the need for the reform of the medieval oligarchies in burghs. The Common Good was in many cases alienated, and cities like Edinburgh hopelessly bankrupt. Money had been borrowed anyhow, and spent in ill-concealed jobbery. But the reward of reformers came at last. Before the close of 1833 Scotland secured her Municipal Corporations Bill, in advance of England. The popular elections to town councils permanently changed the whole country, making it now possible to realise the elementary needs of civic life—water, lighting, cleaning, paving, police, pauperism, sanitation.

**The Church Patronage Question.**

The Act of Queen Anne (1712), in restoring to lay patrons the right of presentation to benefices, had proved a fruitful source of heart-burning and schism. The new political forces were now to be devoted to reform of those abuses of patronage which ran counter to the deeply cherished convictions of the people. The man of the hour was Thomas Chalmers, then recently appointed (1828) to a theological chair in Edinburgh. Eloquent above his compeers, simple-minded, great-hearted, he was devoted to the new spiritual movement. Seeing that the Establishment, in which he had implicit faith, had proved itself unable to Christianise the masses, he took up the cause of Church Extension. His success here, however, precipitated the Disruption, for it helped to make the party of progress predominant in the General Assembly. Hence arose the bitter struggle which began with the Veto Act (proposed 1833, adopted 1834), and ended with the creation of a free and self-supporting Church, independent, as it was believed, of State control (1843). The Veto Act, while it attempted to meet the abuses of patronage by giving the people the privilege of rejecting an unacceptable presentee, had the fatal defect of being but an Act of the General Assembly and not of Parliament. The effect of its operation was speedily to bring the Church into conflict with the civil power: for the Court of Session and House of Lords—notably in the Auchterarder test case—supported the rights of patrons and the rejected presentees. The Non-Intrusionists, as the dominant party were called, represented their position to Government in their Claim of Right (1842): but to the English mind the spiritual independence claimed seemed unreasonable, metaphysical, and impracticable. Defeated in Parliament in

the spring of 1843, the Vetoists, numbering nearly five hundred, solemnly withdrew (18th May) from the General Assembly and from the Church of their fathers, in which, as they believed, their position had been rendered intolerable. The Disruption.

The Disruption, most notable event since the '45, was a huge object-lesson in that interdependence of Church and State which still offers puzzling political problems. Time, however, has removed that phase of Church polity which produced Church and State.

THE SCENE OF THE DISRUPTION: ST. ANDREW'S CHURCH, EDINBURGH.

the cleavage of 1843. The aim of the Non-Intrusionists—a free Church in a free State—has long ago been realised for all sects alike among us. More momentous were the political consequences. Through the inexorable logic of circumstances Chalmers himself and the great body of his followers drifted more and more into the voluntary position as the only tenable one outside an Establishment. For a while he was stoutly opposed by the Voluntaries. To them patronage was of no moment, but the Church extension of the day was intolerable as an aggrandisement of the Establishment at the general expense. Their opposition here led to an organisation of forces which soon bore fruit in their support of the Abolition

The Free Kirk and Politics.

of Tests, and their determined resistance to the Maynooth Grant (1846) and the Edinburgh Annuity Tax, a species of Church rates. Of deeper moment was the action of Scottish Nonconformity on Imperial questions now arising. As far back as 1820 the Edinburgh Chamber of Commerce sent a petition to Parliament in favour of Free Trade, the very first of its kind: and the ultimate triumph of Cobden and Bright was in no small measure due to the support of the Scottish Dissenters. The enthusiasm thus evoked led to great banquets and public meetings (1840–46) and liberal contributions to the war-chest.

Social Aspects of the Disruption.

The unpleasant fruits of the great schism showed themselves for more than a generation, producing much friction, especially through the refusal of sites for churches and manses and many petty acts of retaliation on both sides. The spectacle, however, of a young and self-supporting Christian organisation stimulated its older rival. Hence has arisen that renascence of the Church of Scotland, with its broadening of doctrine and ritual, leavening the thought and practice alike of both the great Presbyterian bodies.

Railways.

In the early days the iron road and the steam motor were developed on independent lines. Up to 1830 ten Bills had been sanctioned for railways by horse traction or fixed engine. The earliest ran (1811) between Kilmarnock and Troon. Facility of goods-haulage was alone considered on these lines, but a very successful one, Edinburgh to Dalkeith (1831), speedily developed an extraordinary passenger traffic. Horse-traction was employed on this line till 1845. On the other hand, steam carriages were running on the highways—as, for example, Scott Russell's between Glasgow and Paisley—but the explosion of the boiler stopped the experiment here. The effect of friction at high speeds was little understood, till Maclaren of the *Scotsman* proved by mathematical reasoning (1824) that on iron roads twenty miles an hour and probably more might be attained. His views attracted much attention on the Continent and in America. The earliest use of the locomotive on rails was in 1827, over a short mineral line near Glasgow. A rival local line from Garnkirk to Glasgow was opened in 1831 by George Stephenson in person; and this became the nucleus of the Caledonian system. The first venture on a large scale was the Edinburgh and

Glasgow (1842), costing a million and a quarter. Its success popularised the railway for passengers, and led to large schemes. Hitherto merely short local ventures had been risked, through routes not being contemplated. Numerous small independent lines were, by a long series of amalgamations, developed into the great systems. Scotland felt the railway craze of 1845-46, fifteen Bills appearing in the former year, fifty-eight in the latter. Before 1846 the East Coast Trunk, forming the North British, was open between Edinburgh and Berwick, and a connection was being projected with Dundee, Perth, and Aberdeen, through the steam ferry across the Forth (1843), and the completion of Granton Pier (1845). The stage coaches were still in full swing, ninety leaving the capital in one day.

The Poor Law, 1845.

The Scottish Parliament legislated for the poor as far back as 1575, but assessment was never made compulsory. The votive offerings of the benevolent were distributed through Kirk sessions, but always as supplementary to the charity of friends and neighbours. The able-bodied destitute had no legal claim, nor was maintenance ever contemplated. This voluntary system, aided by an occasional resort to a tax, suffered a great blow from the rise of Dissent (1733), the break-up of Feudalism (1748), and the consequent shifting of the poorer population. The sale of estates also led to absenteeism. All this was followed by an economic revolution which substituted machine for hand labour. Chalmers was an eloquent advocate of the old, and, as he believed, truly Christian system of relief. Alison, an Edinburgh medical professor, approached the subject from another point of view, and demonstrated (1840) the disastrous failure of voluntary effort and the intimate connection between destitution and the too frequently recurring epidemics. His revelations led to a Royal Commission of Inquiry (1844), followed by the Act (1845) under which legal relief is still administered.

P. W. JOYCE. Ireland.

In 1838 some Protestant gentlemen of Cork who had started a Temperance Society, induced the Rev. Theobald Mathew, a young Capuchin friar, to sign the Total Abstinence pledge; after which he devoted himself heart and soul to the cause of Temperance. Under his guidance the movement spread with extra-

ordinary rapidity. He travelled through every part of Ireland, preaching to great multitudes, and administering the Total Abstinence pledge to hundreds of thousands of all religious denominations; so that in a few years drunkenness, which had been woefully prevalent among all classes, almost disappeared, and the whole face of society was changed. A number of great distilleries and hundreds of public-houses were closed, and crime sank to less than half. Like most great movements it left its

*Photo: Walker & Cockerell.*
FATHER MATHEW, BY E. D. LEAHY.
(*National Portrait Gallery.*)

permanent mark; for though drink has in great measure resumed its sway, yet drunkenness, which before Father Mathew's time was a fashionable vice—a thing to be proud of—came to be looked upon with disapproval, and sobriety to be commended as a virtue.

The Repeal Agitation.

The agitation for a repeal of the Legislative Union between Great Britain and Ireland, carried on in a half-hearted sort of way since about 1810, never took hold of the country till 1840. In that year O'Connell founded the Repeal Association, and in 1843 began to hold what came to be called "Monster Meetings," from the great numbers attending them, to give expression to the popular desire for Repeal. From March to August of that year he addressed about thirty vast assemblages, all perfectly sober, peaceable, and orderly. At Tara, the ancient seat of the kings of Ireland, a quarter of a million of people were gathered.

The next was to be at Clontarf on the 8th of October; but on the evening of the 7th it was prohibited by Government proclamation. After this, O'Connell and several others were arrested, and in May, 1844, were tried and convicted of conspiracy. They were all sentenced to imprisonment; but the judgment was reversed by the House of Lords on the ground that the jury had been grossly packed, and O'Connell and the others were released after an incarceration of three months. Whether it was from age, or infirmity, or the effects of the imprisonment, O'Connell lost heart after this, and the Repeal agitation gradually died out.

WOMAN BEGGING AT CLONAKILTY.

But all public questions in Ireland were now overshadowed by a terrible calamity. In 1845 and 1846 the potato crop, the almost exclusive food of the peasantry, failed; and a famine followed in 1846 and 1847, quite unprecedented in Ireland, and perhaps never equalled in the history of any European country. In 1847 the people died by tens of thousands of starvation all over the country. The Government, though adopting some measures in the shape of public works and other plans of relief, utterly failed to cope with the dreadful crisis. Noble efforts were made by the English people, and private subscriptions came in enormous amounts, especially from England: but, in spite of all, one-fourth of the population of Ireland perished by famine and its attendant epidemics in 1846 and 1847. Yet notwithstanding the failure

Famine of 1846-47.

BOY AND GIRL AT CAHERA.
("*Illustrated London News*," 1847.)

of one particular crop, the country produced ample food for its population in these two years without the importation of one ounce of provision; and during the whole time that the people were perishing of starvation, scores of ships left the Irish ports every day for England laden with corn. The repeal of the Corn Laws in 1846 never touched the famine, for the good reason that, so far as corn was concerned, Ireland was an exporting, not an importing, country. It was a boon to the English people, who live mostly in cities and towns chiefly by manufactures: but the only result for Ireland was the ultimate ruin of one of its main industries, corn-growing, and of all those depending on it.

THE HUT IN THE OLD CHAPEL YARD, SKIBBEREEN.

("*Illustrated London News*," 1847.)

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# CHAPTER XXIII.

## THE RULE OF THE MIDDLE CLASS. 1846–1865.

LLOYD C. SANDERS. Political History.

After the fall of Sir Robert Peel, Lord John Russell, having made futile overtures to the Peelites and Mr. Cobden, constructed a Whig Ministry. Except for Lord Palmerston, who again became Foreign Secretary, it contained few elements of strength. Lord Grey swallowed his scruples and went to the Colonial Office. Lord Lansdowne was President of the Council, Sir Charles Wood Chancellor of the Exchequer, Sir George Grey Home Secretary, and Macaulay, Paymaster of the Forces.

The Irish Famine.

The potato crop had failed again in Ireland, and famine was upon the country with pestilence in its train (p. 339). The measures adopted to meet the crisis were better in intention than in result. The Government started relief-works of a public character, such as road-making. Unfortunately, no control was exercised over the 600,000 applicants, and the grossest abuses prevailed on the part of contractors and labourers. The suggestion of the Lord Lieutenant, Lord Bessborough, that the people should be employed on works intended to improve private property, was only partially carried out. With the fear of the Manchester School before his eyes, Lord John allowed wheat to be exported from Ireland (p. 340), and left the food-supply to the ordinary channels. Tradespeople, therefore, made fortunes while the peasantry starved. Awakened at length, the Government suspended the remaining duties on corn, and distributed food through the agency of local committees. It also relaxed the Poor Law by permitting outdoor relief to the able-bodied paupers. Lord George Bentinck's scheme for building State railways, however, was rejected on inadequate grounds.

Private generosity came to the rescue of the Government, and at last the famine was stayed. But it had left bitter memories behind it. The modification of the Poor Law had encouraged the landlords to evict, and added to the crowds of

Eviction and Land Reform.

reluctant emigrants. Nor was the Encumbered Estates Act, which came in 1849 as a finishing touch to Lord John Russell's Irish policy, altogether a success. It got rid of bankrupt landlords, but it established an unsympathetic class in their stead (p. 516).

Lord Palmerston returned to the Foreign Office with the

LORD GEORGE BENTINCK, AFTER SAMUEL LANE.

*(By permission of the Corporation of King's Lynn.)*

full intention of having his own way. He soon found himself at issue with Guizot and Louis Philippe over the Spanish marriages —a squalid intrigue by which the French king contrived to secure Bourbon husbands for Queen Isabella and her sister. When it succeeded, he informed the French Ambassador that the *entente cordiale* was at an end, because France neither wished for cordiality nor an understanding. He protested against the annexation of Cracow by Austria; he employed the British fleet to put down a revolutionary movement in Portugal: he despatched Lord Minto to lecture the rulers of the various Italian

Foreign Policy.

[1865]

States on the merits of constitutional government. The envoy started, however, two years too late, and similar advice addressed, later on, to the Queen of Spain was met by a request to the British Minister to quit the country.

In 1848 the storm of revolution, which Palmerston had in a measure foreseen, swept over Europe. Thrones tottered, and the

LORD PALMERSTON. BY W. BARRAUD

*(By permission of the Right Hon. Sir Evelyn Ashley.)*

Orleanist dynasty fell. In England the Chartists summoned a monster meeting to Kennington Common, and timid folk trembled for their lives and properties. But the military precautions of the old Duke of Wellington were admirable, and the special constables turned out. Feargus O'Connor's nerves failed him at the pinch, and when the signatures of the huge petition presented to Parliament were discovered to be largely in the nature of practical jokes, Chartism underwent total eclipse (p. 490). In Ireland disaffection ran to greater lengths, but the

**The Year of Revolution.**

**Chartism**

Young Ireland.

Government was prepared. The prompt arrests of John Mitchel, the editor of the *United Irishman*, Meagher "of the sword," and Smith O'Brien, together with the suspension of the Habeas Corpus Act, forced the hand of Young Ireland. Smith O'Brien made a childish attempt to surprise the police at Ballingarry. Dismal failure was the result: he was captured, tried, and condemned to death, but the sentence was, of course, remitted.

Palmerston and the Court.

Palmerston was unpopular at Court for his anti-German policy and his impatience of all control. He appealed to the imagination of the nation at large by his *civis Romanus sum* speech, in which he justified the Government for blockading the Greek coast. In it genuine injuries inflicted on British subjects were adroitly mixed with the dubious grievances of a Gibraltar Jew calling himself Don Pacifico, and his splendid clap-trap carried away the House in spite of the common-sense of Sir Robert Peel. A few days afterwards Peel was dead, killed by a fall from his horse. Unfortunately, Palmerston presumed too far on his popularity with the nation. His constant neglect of the Premier's wishes brought down on him a memorandum from the queen, in which he was commanded to state his proposals in each case and make no alterations after her sanction had been granted. This undertaking he jauntily disregarded, until in December, 1851, he proceeded to give his unofficial approval of the *coup d'état* by which Louis Napoleon overthrew the French Republic, and to repeat that opinion in a despatch to Lord Normanby, our Ambassador at Paris. He was summarily dismissed, after he had declined the Lord-Lieutenancy of Ireland. "Palmerston is out," wrote Macaulay in his diary. "It was high time, but I cannot help feeling sorry."

Fall of the Russell Ministry.

The Ministry did not long survive the loss of its most important member. Its legislation had been chiefly Irish, and the Radicals were bitterly dissatisfied. For the moment the Government had gained credit with the unthinking by passing in 1851 the Ecclesiastical Titles Bill, directed against the restoration of the Roman Catholic hierarchy in England. But the panic soon spent itself, and the measure remained a dead letter. Lord John, who had vainly attempted to reconstruct the Ministry by admitting Lord Aberdeen and Sir James Graham, met Parliament in evil plight. He introduced a Militia Bill to meet the popular demand for more adequate defences against

invasion. Lord Palmerston moved an amendment, which the Government declined to accept, and, as he told his brother, "I have had my tit-for-tat with John Russell, and I turned him out."

The First Derby Ministry.

The queen sent for Lord Derby as the leader of the strongest party in the House. He formed a Conservative Ministry of untried material, with Mr. Disraeli as his Chancellor of the Exchequer. Thanks to Palmerston's patronage, the Government did reasonably well. It carried a Militia Bill which gave general satisfaction, and Mr. Disraeli's adroit Budget was remarkable for a frank acceptance of the doctrines of Free Trade. The general election in the summer, however, left the Conservatives still in a minority. Taunted with Protectionist leanings, Disraeli produced his second Budget in December. It included extensions of the house and income taxes, and Mr. Gladstone attacked it in a memorable speech. The Government was defeated by 305 votes to 286 through the combination of Whigs, Radicals, and Peelites. "This I know," said Mr. Disraeli, "that England does not love coalitions."

The Sikh War.

Meanwhile Lord Dalhousie had extended the limits of British India. Soon after he assumed the government (1848) the Sikhs rose again, but operations had to be delayed until the hot season was over. On the 13th of January, 1849, Lord Gough gained a hard-won victory at Chillianwallah, and on the 14th of February he dispersed the Sikh forces and their Afghan allies at Gujerat. The Punjaub was definitely annexed, and placed under a board on which sat the two Lawrence brothers. The Burmese had again to be chastised for the maltreatment of British subjects, and they were compelled to cede the province of Pegu (1852). Under the doctrine of lapse, which did away with the right of adoption, Lord Dalhousie suppressed the ruling houses of numerous native States. Among them were Sattara, the important principality of Nagpore, and the little State of Jhansi. Oudh was annexed, not from the failure of heirs, but because of the king's gross misgovernment. This policy was fiercely attacked after the outbreak of the Mutiny. Adoption, however, had been the exception rather than the rule under the Mogul Empire, and the significance of the annexation policy can easily be overstated. To Dalhousie, at any rate, India owes railways, the telegraph, and the development of canals and

irrigation. He promoted education and put down dacoity and infanticide.

**Coalition Ministry.**

The Peelites and Whigs had been rapidly drawing together and, on the defeat of the Conservatives, a Coalition Government was formed under Lord Aberdeen. The former group secured the bulk of the Cabinet appointments, Gladstone becoming Chancellor of the Exchequer, the Duke of Newcastle Secretary for War, and Sir James Graham First Lord of the Admiralty. Of the Whigs, Lord John Russell went to the Foreign Office, but soon gave place to Lord Clarendon, though he continued to lead the House of Commons. Lord Lansdowne entered the Cabinet without office, and Lord Palmerston, to the general surprise, became Home Secretary. Sir William Molesworth, who imagined himself a Radical, was First Commissioner of Works.

**Gladstone's First Budget.**

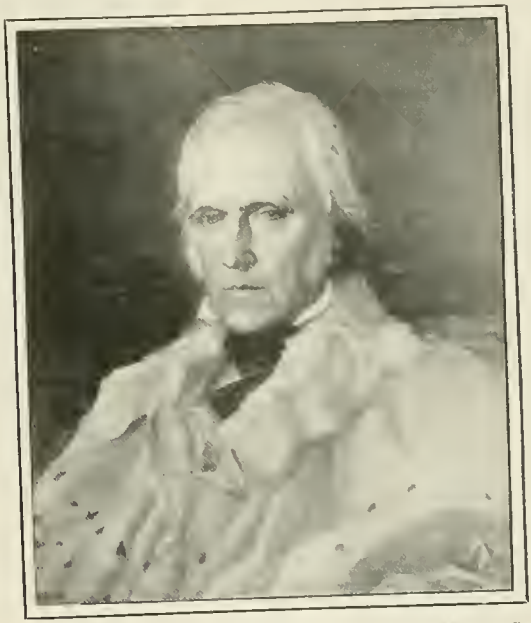
The Aberdeen Government began extremely well. Gladstone's first Budget was his greatest. It made further advances towards Free Trade, and was accompanied by an ingenious though unexecuted scheme for the reduction of the National Debt. In the session of 1853, too, transportation was finally abolished, and the Civil Service of India thrown open to competition. The following year witnessed the passage of the Oxford University Reform Act, based on the report of a Royal Commission. A Parliamentary Reform Bill was introduced, but it was much disliked by a section of the Cabinet, of whom Lord Palmerston pushed his objections to the length of a brief resignation. Occurrences in the East, however, soon drove domestic legislation out of the thoughts of Parliament, and the measure was withdrawn.

**The Eastern Question.**

The Eastern question was revived by a trivial quarrel about the guardianship of the Holy Places in Palestine. Their custody was disputed by the Greek and Latin priests, of whom the latter were actively backed by the Emperor of the French. The Sultan decided in their favour, and the Czar Nicholas blazed out in semi-barbaric anger. He sent Prince Menschikoff to overawe the Porte, and, by way of counter-menace, Napoleon III. despatched the French fleet to Smyrna. The Russian envoy retired, baffled by our ambassador, Lord Stratford de Redcliffe, but in the meantime the French and English squadrons had advanced to the Dardanelles. On July 2nd, 1853, the Russian armies crossed the Pruth, and occupied the Turkish provinces of Mol-

[1865]

davia and Wallachia. The Porte was advised not to declare war, and the Vienna Conference assembled in the hope of arresting the clash of armies. The Sultan, however, insisted on modifying the terms known as the Vienna Note, and the Czar refused to accept his alterations. While Lord Stratford de Redcliffe was pressing a fresh note of his own on the Porte, it suddenly



LORD STRATFORD DE REDCLIFFE, BY G. F. WATTS, R.A.
*(National Portrait Gallery. By permission of Mr. F. Hollyer.)*

declared war. The Russians (December 12th) fell upon the Turkish squadron at Sinope, and burnt, sank, or captured it. Early in January the allied fleets entered the Black Sea.

**The Crimean War.**

Negotiations still continued, but to no purport, and on March 28th, 1854, England and France declared war against Russia. Unfortunately the war party in the Cabinet, Lord Palmerston and Lord John Russell, distrusted Austria, and no adequate attempt was made to secure her support. Checked by the defence of the Danubian fortresses, the Czar directed his forces to recross the Pruth, and Austria remained neutral. The Russian Black Sea fleet withdrew under the guns of Sebastopol, and Sir

Charles Napier drove the Baltic fleet into Cronstadt, though he could make no impression on that fortress. The allies determined on a descent upon the Crimean peninsula, the idea originating with the Emperor of the French. Their armies had already suffered severely from cholera on the marshy ground of Varna. Nevertheless, on the 20th of September the battle of the Alma was fought and won. The opportunity of taking Sebastopol by an attack from the north was lost, and the allies made, instead, a long and hazardous flank march to the southern coast of the peninsula. When the bombardment began (October 17th) the defences of the stronghold had been materially strengthened. Eight days later Menschikoff arrived to relieve it, and at Balaclava the British cavalry won the day despite Lord Raglan's ineffective generalship. The glorious but useless charge of the Light Brigade has won an immortality which has been denied to the decisive onset of Scarlett's heavy cavalry. At Inkerman (November 5th) the first line was left for hours without support, but it repulsed the Russians again and again. Menschikoff drew off, and the allies were fairly free to press the siege. But winter was upon them; a storm wrecked the transports on November 14th, leaving the troops destitute of warm clothing and almost shelterless; the roads became quagmires (p. 364). The men, worn out by work in the trenches, died of sickness by hundreds. The letters of Dr. Russell, the correspondent of the *Times* (p. 368), roused the nation to fresh efforts, and incidentally drove the Aberdeen Ministry out of office. Supplies were despatched hot-haste, together with trained nurses under Miss Nightingale. In the spring the prospect improved apace. The Czar Nicholas died, and was succeeded by the peace-loving Alexander II. A Sardinian contingent joined the allies, and, in conjunction with the French, beat off the Russians at the Chernaya. The siege went on, and at last, in September, the allies ventured an assault. The British force was beaten back from the Redan, but the French, under Mac Mahon, carried and held the Malakoff. Thereupon the Russians evacuated Sebastopol by night, and on the 8th of September the place surrendered. Against this decisive success had to be set the fall of Kars in Asia Minor, where the valour of General Fenwick Williams was of no avail, since he was left without reinforcements by the Turks.

Sufferings of the Troops.

"GENERAL FÉVRIER" TURNED TRAITOR.

*(Reproduced by special permission of the proprietors of "Punch.")*

The First Palmerston Ministry.

The Coalition was defeated on a motion of Mr. Roebuck's for an inquiry into the Navy and War Departments. Lord John Russell, whose conduct towards Lord Aberdeen had throughout been the reverse of generous, resigned directly it was announced. A combination of Conservatives, Radicals, and discontented Whigs beat the Government, on January 29, by a majority of 127. A ministerial interregnum followed, during which Lord Derby, Lord Lansdowne, and Lord John Russell in vain attempted to scrape Cabinets together. Then the queen sent for Lord Palmerston—"the inevitable," as he described himself. He formed a Whig and Peelite Ministry, but the Peelites resigned almost immediately because the Premier agreed to the appointment of Mr. Roebuck's committee. In its final form the Cabinet included Lord Lansdowne without office, Lord Clarendon as Foreign Secretary, Sir George Cornewall Lewis as Chancellor of the Exchequer, Lord Panmure as Secretary for War, and Sir George Grey as Home Secretary.

Peace of Paris.

Lord John Russell, become Secretary to the Colonies, was despatched to the Conference sitting at Vienna. Terms of peace were there suggested by Austria, which both the French and English envoys thought might be accepted. They were, however, disavowed by their respective Governments; and Lord John, threatened by a vote of censure, ceased to be Colonial Secretary. After the fall of Sebastopol, Austria made fresh proposals, this time in the form of an ultimatum to Russia. A congress met at Paris, and Lord Clarendon and Lord Cowley, disconcerted by the double-dealing of the Emperor of the French, had to consent to rather unsatisfactory terms (March, 1856). There was a mutual restoration of conquests, including that of the Principalities and Kars to the Turk. The Black Sea was neutralised to ships of war and military arsenals. Sebastopol was destroyed as a fortress, and the Danube thrown open to navigation. By the accompanying Declaration of Paris, England abandoned the right of search with regard to neutral vessels, in return for the agreement that blockades, to be recognised, must be effective. The Powers also put on record the statement that "privateering is and remains abolished." By a separate treaty, signed April 13th, Austria, France, and England guaranteed the continuance of the Ottoman Empire.

The Palmerston Ministry did not trouble itself overmuch

about domestic legislation. The outlook abroad was disquieting, owing to the pettifogging evasions of her treaty obligations by Russia and the shiftiness of the Emperor of the French. The country, too, became involved in wars with Persia through the Shah's attack on Herat, and with China because of the seizure of the lorcha *Arrow* (p. 369). Sir James Outram made short work with the Persians. The Chinese agreed to peace in 1858, after the fall of Canton. However, they fired on the British Minister, who was on his way to get the treaty ratified, and in 1859 a joint English and French expedition was sent against them. After a check on the Peiho, it took Pekin, and the Treaty of Tientsin, which opened more ports to trade, was confirmed in 1860.

**Persian and Chinese Wars.**

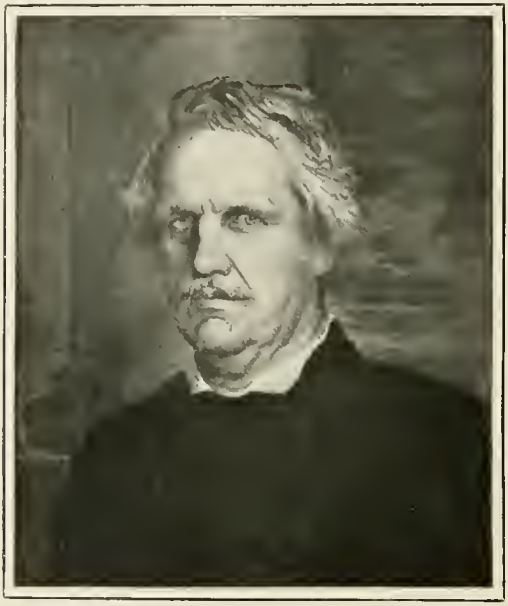
Mr. Cobden moved a resolution condemnatory of the Chinese war, which the Government treated as one of censure. It was defeated by sixteen votes, in spite of the Premier's "bow-wow" speech—as Greville calls it—and went to the country. At the general election of 1857 the Manchester school was wiped, for the time being, off the face of the earth. But Palmerston's triumph was brief. In the following February, at the demand of Napoleon III., whose nerves had been shaken by Orsini's attempt on his life, the Government brought in a Conspiracy to Murder Bill, which was regarded as threatening the right of asylum. Unfortunately, the violent language used across the Channel irritated the House, and Ministers were defeated and resigned.

**Palmerston's Fall.**

The outbreak of the Indian Mutiny in 1857 (p. 369) took even the most experienced officers and administrators completely by surprise. It resolved itself into an unreasoning expression of discontent and fanaticism, worked upon by secret intrigue. The sepoys had been indulged until they fancied that the destinies of India lay in their control. They were horrified by the issue of new Enfield cartridges said to be greased with the fat of beef or pork, and thus unclean both for Hindoo and Mohammedan. They saw their opportunity in the absence of those British regiments which had been ordered to Persia and the Crimea, and had never been replaced. There was a sputter of mutiny on February 25th at Barrackpore: on the 10th of May it broke out in earnest at Meerut, where the officers were murdered. Regiment after regiment raced off to Delhi, where the restored

**The Indian Mutiny.**

Emperor became a centre of disaffection. Happily, the Bombay and Madras Governments rose to the crisis, and John Lawrence held down the Punjaub. But the North-west and Oudh were gone, except for a few hard-pressed garrisons; and in Central India, though Scindiah and Holkar were staunch, their body-guards went over to the enemy. Nana Sahib besieged the crazy outworks of Cawnpore, and on the 27th of June perpetrated that



LORD LAWRENCE, BY G. F. WATTS, R.A.
(*National Portrait Gallery. By permission of Mr. F. Hollyer.*)

awful massacre which has rendered his name for ever infamous. Too late to save the garrison, Havelock and Outram relieved Lucknow on September 24th, only to find themselves besieged. Until Delhi fell, India could not be reckoned a British possession. The siege flagged, owing to lack of men and ordnance, but John Lawrence's Sikh levies and the arrival of the siege-train decided the matter, and on the 20th of September the city was won. Slowly pushing onwards, Sir Colin Campbell, the new commander-in-chief, effected the final relief of Lucknow in November. Lastly, Sir Hugh Rose, in the most brilliant

CAWNPORE IN 1857. (*From a contemporary print.*)

operations of the war, cleared Central India of the Rance of Jhansi and Tantia Topee, Nana Sahib's able but cowardly lieutenant. The last embers of rebellion were stamped out in the early summer of 1859.

India transferred to the Crown.

The East India Company had become an anachronism, and the Derby Ministry, which had succeeded Palmerston's, carried a Bill transferring the government to the Crown. The Company was dissolved, and the Board of Control abolished. In its stead a Secretary of State for India was appointed, with a council to advise him. In India her Majesty's representative was given the rank of Viceroy, with authority over the Provincial Governments, which, however, continued their separate existences. The military forces of the Company were united with the British army. Lord Canning, whose steadfastness during the Mutiny was recognised by his nomination as Viceroy, announced the new order at a durbar held on November 1st, 1858.

Second Derby Ministry

Lord Derby's second Ministry was composed of much the same materials as the first. It existed because the Liberals and Radicals were unable to reconcile their differences. During the remainder of the session of 1858 it passed, in addition to the Bill transferring India to the Crown, a measure admitting Jews to Parliament. Forced to take up reform, Mr. Disraeli introduced next February a Bill which satisfied neither his own party nor the Opposition. Mr. Henley and Mr. Walpole resigned, while Lord John Russell condemned the disfranchisement of the borough freeholders and the non-reduction of the borough qualification, together with certain so-called "fancy franchises" that Mr. Disraeli had invented. Defeated on the second reading by 39, the Government appealed to the country, but the general election left it still in a minority. The Opposition composed its quarrels at Willis's Rooms, and Ministers were beaten by thirteen votes on a resolution of want of confidence moved by Lord Hartington.

Second Palmerston Ministry.

The queen sent for Lord Granville, rather than undertake the "invidious, unwelcome task" of making choice between Lord Palmerston and Lord John Russell. He failed, however, to form a Ministry, and Lord Palmerston assumed the Premiership. Of the former Whigs it contained Lord John Russell as Foreign Secretary, the Duke of Argyll as Lord Privy Seal, and Lord Granville as President of the Council. The Peelites were

represented by Mr. Gladstone as Chancellor of the Exchequer, Mr. Sidney Herbert as Secretary for War, and the Duke of Newcastle as Secretary for the Colonies. Mr. Milner Gibson, a Radical hostage, went to the Board of Trade.

Foreign Affairs: England and France.

There followed a period of Parliamentary repose, but of much disturbance abroad. Lord Malmesbury's well-intentioned but fussy diplomacy had failed to avert the declaration of war by the Emperor of the French against Austria on behalf of Italian unity. The Prime Minister and Lord John Russell were enthusiastic in the cause, and their diplomatic action occasionally overstepped the limits of strict neutrality. They were much disgusted by the Treaty of Villafranca, whereby Napoleon III. abruptly withdrew from obligations that were becoming too heavy for him; and they declined to co-operate in preventing Garibaldi from crossing over the Straits of Messina to Naples A feeling of rooted suspicion with regard to France came over Lord Palmerston's mind. He met the rapid increase of the French fleet by introducing a Fortifications Bill, which provided for the defences of Portsmouth and Plymouth in 1860, and he encouraged the Volunteer movement (p. 370). However, personal explanations removed his distrust to some extent. The Commercial Treaty negotiated by Mr. Cobden in the same year improved international relations. The two Powers joined, as already mentioned, in chastising the Chinese and in coercing Mexico, until in 1862 Napoleon III. thought fit to enthrone Maximilian of Austria there as a phantom Emperor (1863).

America and Denmark.

Lord John Russell, become Earl Russell, was a rash Foreign Secretary, and his "rich harvest of autumnal indiscretions," as Mr. Disraeli phrased it, brought some loss of popularity on the Government. On the outbreak of the American civil war he steadily refused, indeed, to be dragged by the Emperor of the French into the recognition of the Southern States; he also behaved with dignity and promptitude when Captain Wilkes forcibly took the Confederate envoys, Mason and Slidell, from the British mail steamer *Trent*. But a better understanding with the American Minister, Mr. Adams, would have prevented the departure of the privateer *Alabama* from the dockyard in which she had been built to swoop upon the Northerners' merchantmen, and thereby Earl Russell brought upon his country a heavy reckoning (p. 525). He was hardly more

fortunate in his treatment of European affairs. His remonstrances on behalf of Poland brought upon him the most unmistakable of snubs from Prince Gortschakoff. He went dangerously near promising assistance to the Danes when, on the re-opening of the Schleswig-Holstein question after the death of Frederick VII., they were menaced by the allied forces of Prussia and Austria. When he found that the Emperor of France, disgusted by his refusal to send British representatives to a projected

THE SEIZURE OF THE CONFEDERATE ENVOYS, 1861.
*(Reproduced by permission of the proprietors of the "Illustrated London News.")*

Congress for the revision of the Treaty of Vienna, declined to stir, he had to wriggle out of his undertakings as best he could. It needed all Palmerston's tact to avoid a Government defeat.

**Home Politics.**

Much to the disgust of the Radicals, the sessions were almost barren of legislation. Lord Westbury, the Lord Chancellor, carried a Bankruptcy Bill, but his legal reforms were cut short by his enforced resignation on a Parliamentary censure of his mode of administering his patronage. Earl Russell was humoured by being allowed to bring in a Reform Bill, but there was no demand for it, and it died in committee. Mr. Gladstone's Budgets, on the other hand, put an abundant revenue to excellent uses, and removed duties without lessening income.

1865]

He chafed under the Prime Minister's zeal for the defences and, in 1860, had to put up with the rejection of the Paper Duties Bill by the House of Lords at the instigation of Lord Lyndhurst. **The Paper Duties.**

DAME COBDEN'S NEW PUPIL.

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A constitutional quarrel seemed imminent between the two Houses, but the Prime Minister obtained the appointment of a committee, and so allowed passions to cool. There was a truce of parties, barely interrupted by the general election of 1865,

Death of Palmerston.

until, on the 18th of October, Lord Palmerston died in his eighty-second year. Though a strangely Conservative leader of the Liberal party, he represented in his fearlessness and energy the best qualities of the English people. He had been preceded to the grave on December 14th, 1861, by the Prince Consort, who, understood at last by the nation, had lived down the unpopularity under which he laboured at the time of the Crimean war

G. LE M. GRETTON. The Army.

In the spring of 1854 the Government sent a large force of British troops to Eastern Europe to act in concert with the French in the defence of Turkey against a Russian invasion. The expedition consisted of an aggregation of battalions, batteries and cavalry regiments, magnificent in drill and in physique, but wholly unused to working together as integral parts of a great fighting machine. At the beginning of 1854 the numbers of the army had fallen so low that to bring these different corps up to their war strength had been most difficult. In the words of the Secretary-at-War, "The army in the East was created by discounting the future. Every regiment at home, or within reach, and not forming a part of that army, was robbed (of its men) to complete it." Most of the generals were old men who had learnt nothing since the days of the Peninsular War. The staff, "the brain of the army," were no better trained in their profession than the regimental officers, for the Staff College was not founded until 1858. The system of the Commissariat department was not only hopelessly complicated, but inherently vicious; for the officials, whose duty it was to feed the troops and transport the stores, were not under the orders of the head of the army in the field, but of the head of the Treasury in London. For nearly forty years the nation, by its persistent neglect of all military questions, had sown the wind; and in the winter of 1854 the army in the Crimea reaped the whirlwind.

The Crimean War.

In August, 1854, the Cabinets of London and Paris decided to attack Sebastopol, the great Crimean fortress from which Russia threatened the safety of Constantinople; and early in September a noble fleet of men-of-war and transports—600 vessels, guarded by 3,000 guns—reached the Crimea, a part of Russia then almost unknown to the nations of Western Europe.

1865]

On the 14th of September the allied army—composed of 25,000 English, 30,000 French, and 7,000 Turks—landed unopposed at Calamita Bay. Here history once more repeated itself. As in Schomberg's descent on Ireland in 1689, so in the invasion of the Crimea more than a century and a half later—our troops were disembarked without the means of moving away from the beach on which they had landed. With great difficulty carts were obtained from the natives, but in wholly insufficient quantities. For a battalion of infantry the proper allowance of transport in the field is five carts and eleven waggons. On the march to Sebastopol, after the battle of the Alma, only about nine carts were available for each division, to carry the baggage, medical stores, tents, and sick and wounded men belonging to the six battalions and two batteries of which each of the divisions was composed. In Bulgaria the Commis-

SEBASTOPOL IN 1854, AFTER W. TELBIN.

sariat had collected, with great trouble and expense, several thousand mules, horses and ponies; but for some departmental reason most of these beasts of burden had been left behind at Varna, although they would have been invaluable on landing in the Crimea

Failure of Supply and Transport.

After the victory of the Alma Lord Raglan, though grievously hampered by want of transport, pushed on to Balaclava, the fishing village which became our base of operations during the war. He encamped on a line of heights, some six or seven miles from the little bay on which Balaclava stands, and at once broke ground against Sebastopol. As the Commissariat could draw no supplies from the enemy's country, everything which the army required had to be brought by sea, landed at Balaclava, and carried up to the troops at the front. As long as the weather continued fine things went fairly well: but when the autumn rains set in the road from the port fell into a wretched condition. No men could be spared from the trenches for road-making; and the expedient of breaking up a wooden merchant ship, and laying down her timbers as a corduroy road, seems to have occurred to no one. Thus the troops on the "Upland" (as the heights were termed by Kinglake), separated from their supplies by an almost impassable slough of miry clay, were gradually reduced to the greatest misery. About the middle of November, when the pressure of actual want was first felt in our camps, there were still 2,000 beasts of burden at Varna. Some of them were brought from time to time to the Crimea, but they were soon worked to death: and in January, 1855, our available transport had dwindled down to less than 350 animals and 120 carts. How utterly inadequate this transport was may be inferred from the fact that twelve months later, with only double the number of men before Sebastopol, 8,000 animals, 200 waggons, 500 carts, a good road and a railway from Balaclava to the front, were found necessary to supply the wants of our besieging army. From the Turkish provinces on the Black Sea our fleets of transports could have brought over numbers of excellent horses, but the Commissariat made no effort to obtain them, because there was no forage in store on which animals could be fed. The officials at home had forgotten to send to the Crimea the 2,000 tons of hay which had been asked for; and the Commis-

Lack of Forage.

THE CAVALRY CHARGE AT BALACLAVA, OCTOBER 25, 1854.

sariat at the seat of war had not the initiative to send ships round to the neighbouring countries to buy up forage. Sooner than face the responsibility of departing from strict official routine, they allowed the pack animals to die like flies from starvation and overwork. The transport virtually ceased to exist, and the cavalry horses perished so fast from want that the efficiency of the mounted branch of the service became seriously impaired.

**Overwork of the Troops.**

In every siege the strength of the besieging force is of necessity severely taxed. In addition to the ordinary duties of a camp, and of the outpost service against surprise, the troops have to provide labourers for digging in the trenches, and strong covering parties to protect them against the enemy's sorties. But our men were called upon to do far more than this in the Crimea. Owing to the failure of the transport, the soldiers, when not actually on duty before the enemy, were (to use their own expression) "turned into commissariat mules," and constantly struggled down to Balaclava to obtain supplies for the "upland" camps. "I have seen our men," wrote Colonel Colin Campbell of the 46th, "after having come back from the trenches, and having barely time to eat some biscuit and coffee, sent off to Balaclava to bring up rations, warm clothing, blankets, etc. They would return at night after their fourteen-mile tramp through the mud, and throw themselves down on the floors of their tents as if they were dead, so exhausted that even if their dinners had been got ready for them, many of them could not have eaten a morsel. Next morning probably a third of them would be in hospital, and the remainder for the trenches the following evening."

**Want of Food and Clothing.**

In the early part of the winter the condition of the men was terrible. Insufficiently protected from the weather by leaky tents, they slept in puddles on the bare ground. Though constantly wet through by rain and snow, they were without a change of clothes or boots. Their uniforms were in rags, their boots dropped to pieces in the mud. Their food (when they could get it) consisted of biscuit, rum, and salt beef or pork, the latter the more popular because it could be eaten raw; for until the end of December the Commissariat threw upon the troops the burden of foraging for their own fuel. Even when the men had been successful in their quest for wood their difficulties were

not over, for of the camp kettles served out when the army landed in September, many had been lost or become unserviceable; and to all requisitions for a fresh supply the Commissariat had one stereotyped reply, "None in store." In a winter campaign hot coffee is a necessity of life; and coffee was issued, but unroasted and unground, so that its preparation entailed endless labour upon the men. This extra labour the Commissariat contemplated with equanimity, for as early as February, 1854, when supplies of stores were being discussed, the Commissary-

WINTER IN THE CRIMEA.

(*By permission of the Proprietors of the "Illustrated London News."*)

General had written: "The soldiers will no doubt find some means of overcoming any difficulty that may arise from the want of mills and coffee roasters."

From want of green food scurvy soon broke out, and the doctors began to clamour for vegetables—but in vain. Not only did the Commissariat fail to provide vegetables, but it was so tied and bound by red-tape, that when a ship arrived laden with cabbages, a present for the troops, no departmental official would take the responsibility of giving a receipt to the master of the vessel, who kept the cabbages on board till they became rotten, and then discharged them into the sea. Lime-juice was necessary to keep down the scurvy; but though on December 19th, 1854, **Red Tape.**

there were 600,000 rations in store, it was not until February, 1855, when the disease was rampant throughout the army, that the first issue was made to the troops. There were abundant supplies of cattle within a week's sail of the Crimea; and as the oxen would have been driven from Balaclava to the camps and slaughtered there, no difficulties about land transport could have arisen. "But the Commissariat urged the necessity of having steamers for their transports, which were not always available, forgetful of the fact that the Duke of Wellington fed his troops for months at Torres Vedras on fresh meat brought in sailing ships from the north of Spain."

The Sick.

The sick in the Crimea were even in worse plight than the men who were able to struggle on at duty, for the army was insufficiently supplied with the most necessary medical stores. In October, arrowroot, sago, brandy, essence of beef, and candles to light up the hospital tents were unprocurable. In November, when about a third of the army were suffering from bowel complaints, such drugs as castor oil, opium, or chalk, were reported "not in store." A doctor, in writing about his men in camp, says: "Sick asking for soup and sago, but I have to give them medicine instead. Few of them would have been patients if they had had more clothing, less fatigue, less exposure, and more food." In the hospitals on the "Upland," the sick lay on the bare ground, often in mud, frequently fed on salt beef and biscuit. To save their lives, the doctors hurried them down to Balaclava, to be shipped off to the great hospital which we had established at Scutari, close to Constantinople. As we had no ambulances of our own, we borrowed the French mule litters; but when these were not available, our sick and wounded were hoisted upon the backs of cavalry horses and so transported to Balaclava. There the one hospital held only 400 men, so that the large majority of sick and wounded were laid upon the beach, exposed to all weathers, while awaiting their turn for embarkation in the transports. On board these ships the arrangements were so utterly bad that eight or nine per cent. of the invalids died on the two days' voyage. In the hospital at Scutari, until Miss Nightingale and her sister-workers evolved order out of chaos, the mismanagement was atrocious. One detail will be enough. During the month of November there were about 2,000 patients, of whom a large number were suffering from dysenteric disorders, and

required absolute cleanliness, yet the total number of shirts washed during those thirty days was six. But what could be expected from the Medical Department when its head, the Director-General, had to receive his orders from five different superiors—the Commander-in-Chief, the Secretary of State, the Secretary-at-War, the Master of the Ordnance, and the Board of Ordnance? During the first winter the death-rate was very

*Photo: S. A. Payne, Aylesbury.*

FLORENCE NIGHTINGALE.

(*The Bust paid for by the Pennies of the Soldiers.*)

heavy; including the hospitals in the Crimea and Scutari, 1,900 men died in December, 3,000 in January, and 2,500 in February. In the camp before Sebastopol, the number of men who fell ill was alarming. In November, out of the 25,000 troops who originally landed, nearly 17,000 were sick; in December nearly 20,000 men were off duty; and in January, 1855, no less than 23,000 men were on the sick list. Though every available man was hurried out from England, our force so dwindled that in January the French had four times as many effectives before

Sebastopol as we could produce. As our reinforcements arrived, they were kept almost incessantly in the trenches, until broken down by fatigue, exposure, frost-bite, and hunger, they too began to fill the hospitals with sick. Throughout this misery, all ranks behaved gallantly; and (to quote Lord Wolseley) the private soldier, on whom the greatest hardships fell, "for the honour of England, met his death without a murmur. He knew that no stars or ribands could by any chance fall to his lot, yet he fought like a hero, and suffered with the steadfastness of a martyr. The history of his devotion to duty, of his determination to maintain at all costs the credit of the British army, is beyond any praise."

The "Times" Correspondent.

Among the non-combatants in the Crimea was William Russell, the special correspondent of the *Times*. His vivid descriptions of the misery around him suddenly revealed to the nation the astounding fact that, while the British navy possessed a command of the sea so absolute that not a Russian man-of-war dare venture out of harbour, the British army, encamped within seven miles of the sea, almost within sight of the masts of the fleet, lay rotting with scurvy and dying with cold and want and hunger. There was a tremendous burst of indignation; and stores of every kind were hurried to the seat of war, in time to save the lives of many brave soldiers who would otherwise have perished. But for many more no human efforts were availing, and forty per cent. of those who served before Sebastopol in the depth of the winter 1854 55 rest on the upland of Balaclava, or in the cemetery of Scutari. Early in 1855 things began to mend. The Commissariat was shaken out of its lethargy: a transport corps was formed; navvies were sent from England to make a railroad to the front; the invalids began to return to duty, and fresh troops continually arrived from England. Of these, many were volunteers from the militia regiments which had been embodied early in the war. Once more the Constitutional Force justified its existence; not only did it contribute some 30,000 officers and men to the army, but it assisted to garrison Malta Gibraltar, and the Ionian Isles, and thus set free a large number of regular troops for duty before Sebastopol.

The Militia and the War.

By the end of 1855 we had 4,000 cavalry and 45,000 infantry, with 100 field-guns in the Crimea, besides a Turkish contingent of 20,000, officered by Englishmen, and a German contingent of 10,000 men. Two or three months later 18,000 troops were

assembled at Aldershot, ready to embark, if necessary, for the East. But on April 2nd, 1856, peace was proclaimed, and no further reinforcements were required for the Crimea.

Tactics.

Little need be said of our tactics on the Crimean battlefields. At the Alma in two-deep lines we attacked the heavy columns of the Russians, and vanquished them—to their intense surprise, as they did not think it possible for men to be found bold enough to attack in this apparently weak formation. Balaclava was a display of brilliant but misdirected valour. Inkerman, fought in a fog, was essentially a soldiers' battle, in which the rank-and-file by their marvellous courage and steady discipline alone saved the army from annihilation or captivity.

Officers and Men.

In the Peninsula the troops were often grossly neglected by their superiors (Vol. V., p. 721); but in the Crimea officers began to realise that one of their most important duties, in peace or war, is to attend to the food, the clothing, the comfort, and the amusements of their men. The good feeling between all ranks, produced by this constant and watchful care, is one of the most characteristic features of the British army of to-day. A few years before the Crimean war, Napier, the conqueror of Scinde, had startled his contemporaries by mentioning in despatches (almost for the first time in English history) the names of private soldiers who specially distinguished themselves in action; and he thus paved the way for the institution of the Order of the Victoria Cross in 1856, a thoroughly democratic decoration, open to every rank in the army. Before the V.C. was granted, officers who distinguished themselves could aspire to various honours, but soldiers who performed some desperate act of courage were rewarded by a mere dole of money.

The Persian and Chinese Wars.

Only a few months after peace was made with Russia, England found herself again at war. A question respecting the possession of Herat, on the Afghan frontier, involved us in hostilities with Persia, and before our troops had returned, victorious, from the Persian Gulf, troubles had arisen in the Far East. Repeated insults to our flag compelled the Government to demand reparation from the Chinese Emperor. While the expedition was on its way to China, the British Empire was horrified by the mutiny of the native army in Bengal, where the sepoys, suddenly turning their arms against the English officers who had so often led them to victory, murdered many of them,

The Indian Mutiny.

and butchered all the white women and children upon whom they could lay their hands. Happily for Britain the ranks just then were full, as the men who had enlisted during the Russian war were still with the colours. Many militia battalions were again embodied, and, by taking over garrison duty in various places, at once set many thousand soldiers free for active service in India. Strong reinforcements were hurried out to support the handful of white men, who, scattered in feeble garrisons throughout Bengal, with infinite heroism were holding their own against the overwhelming masses of the mutineers—veteran soldiers, who had been drilled and trained and disciplined in the same school as the British troops. In point of the calm and steadfast courage displayed, the campaigns of the Crimea and the Mutiny are alike; but in other respects the contrast was startling. In the Russian war the army was tied hand and foot by red-tape, and any exhibition of intelligence and of initiative was discouraged. In India, on the contrary, soldiers and civilians alike showed themselves full of initiative and of resource, and, above all, were ready to accept responsibility and its consequences.

The Volunteer Movement.

Hardly had the Mutiny been quelled when the attitude of France towards this country became so threatening that the Volunteer force sprang into existence. To this movement the nation owes much. Opinions differ as to the fighting value of men who, after having as recruits attended the regulation sixty lessons in drill, are only compelled to annually appear ten times on parade and to fire twenty shots at a target. But one thing is certain. The Volunteers have largely contributed to dispel the old dread of a standing army, the bugbear of the English people since the Restoration. They have familiarised the electorate with the idea that soldiers are necessary for the very existence of England. They have assisted to popularise the army among the classes from which its recruits are chiefly drawn. Above all, they have taught the practical lesson in patriotism that it is the duty of the citizen to be prepared, in case of need, to fight in defence of his country.

W. LAIRD CLOWES. The Navy.

Soon after the final adoption of the screw in the Navy, and even before the adoption of iron as the material for the hulls of British fighting ships, important improvements in entirely new

1865]

directions became necessary. The power of the gun had begun to grow greatly, partly in consequence of the development of shell-fire; and the swift and tragic destruction, by shell-fire almost exclusively, of the Turkish squadron off Sinope by a Russian squadron on November 30th, 1853, demonstrated that the time had come for inventive genius to devise means for the protection of ships and human life from at least some of the effects of the incendiary missiles. The first result was the building, for the purposes of the war with Russia, of armoured

*Photo: W. Symonds & Co., Southsea.*

H.M.S. *WARRIOR*.

floating batteries. The credit of the invention is due to France; but plans of the vessels were sent to England, and in 1855 this country constructed the four wooden-hulled armoured batteries *Trusty*, *Thunderer*, *Glutton*, and *Meteor*, following them up in the succeeding year with the iron-hulled armoured batteries *Thunderbolt*, *Terror*, *Etna*, and *Erebus*. The earlier type was of about 1,540 tons, the later one of about 1,950 tons: and the speed was in the one case 4.5, and the other 5.5 knots. The smaller type carried 14, and the large 16 68-pounder smooth-bore guns, 10 feet long, and weighing 95 cwt. France again led the way by laying down in March, 1855, the sea-going wooden armour-plated frigate *La Gloire*, the prototype of a class of four

**Guns *versus* Armour.**

sister ships; and Great Britain followed by laying down in 1859 the much larger and more powerful iron-hulled armour-clad *Warrior*. *La Gloire* was 252 feet long, and had a speed of little more than 12 knots. The *Warrior* was 380 feet 2 inches long, and had a speed of 14.3 knots. Each carried 4.5 inches iron armour. But it was presently found that such thin plating was of little or no value against the improved guns which were rapidly coming into use. Guns grew larger than they had ever been before; the rifling of them improved their accuracy, and, by reducing the windage between the projectile and the bore, gave them greater velocity, penetration, and range; the introduction of the various breechloading systems further advanced their powers; the new practice of building up guns, instead of casting or forging them, facilitated the creation of still heavier weapons; and finally the adoption of slower-burning powders allowed the charge to expend its full force in the most advantageous manner before the instant when the projectile quitted the gun. The effect, briefly summarised, of all these and other advances was that, whereas in 1860 the largest gun afloat was just equal to the penetration of 4½ inches of iron at the muzzle, in 1885 the largest gun afloat was fully equal to the penetration of 34 inches of similar armour. The quarter of a century was naturally, therefore, one of continual struggle between gun and armour. In the course of the rivalry, there came a time when the thickness of iron armour needed to withstand a fair blow from the biggest gun of the moment was so great that for a ship to attempt to carry much plating of that weight was hopeless. Accordingly the attention of inventors was directed to the discovery of some process whereby the resisting quality of the plating might be improved, without unduly increasing the weight. This brought about the introduction of compound armour, *i.e.* of iron armour faced with steel; and then, as the gun again forged to the front, of solid steel armour; while, at last, even the solid steel had to have its face further hardened, by special treatment, until it became so intractable as to turn the edges of the best-tempered tools. It is probable that the finest armour existing in 1885 had, thickness for thickness, more than one and a half times the resisting power of the plain iron armour put upon our first sea-going ironclad, the *Warrior*; yet, upon the whole, victory remained with the gun. Armour

1865]

could be manufactured to keep out everything that could be thrown against it; but, if made of the needful thickness, so little of it could be carried by any ship of practicable proportions that it would be possible to protect only a very limited area. Keeping in view that armour in action is more advantageously situated than armour on the proving grounds, naval constructors compromised matters. They put exceedingly thick armour over a few vital or otherwise important places; they placed thinner armour on larger but less critical areas; and they left a considerable part of the ship without vertical armour of any sort, trusting to be able to assure the stability of that part by working into the ship's structure a curved steel deck, so arranged that its edges were well below the water-line, while its centre was above it. The theory was that a projectile striking a part thus protected would, if it encountered the curved surface, be deflected upwards, instead of passing right through the ship near or below the water-line, and that any water admitted above the still intact steel deck could be easily controlled by means of the pumps. The protective deck, as this device was called, was also employed in vessels which had no vertical armour whatsoever; but towards the end of our period the introduction of the quick-firing gun lent a renewed importance to vertical armour, even if comparatively thin: and in 1885 a tendency was visible—first abroad, and then in England—to revert to the practice exemplified in most of the earliest ironclads, of armouring vertically as great an extent of a fighting ship's side as could be armoured, not so much in order to prevent penetration by the few heavy projectiles as to cause the raining shells from the quick-firing guns to burst outside the vessel. But the carrying-out of these principles had then barely begun.

W. H HUTTON. The Church.

From 1846 the Tractarian movement was no longer most definitely connected with Oxford. Some of its leaders had left the University, one had left the English Church, Pusey, though he continued till the end of his long life to reside nearly the whole year in Oxford and to teach as an University Professor had an influence which extended far and wide over England while Keble, from the quiet country parsonage of Hursley exercised a power hardly less great.

"The Guardian."

Among the earliest signs that the movement had taken root outside the place of its origin was the foundation of *The Guardian* newspaper in January, 1846. This was the work of Oxford men who were in general sympathy with the Tractarians: the chief of them were Frederic Rogers (afterwards Lord Blachford) and R. W. Church (afterwards Dean of St. Paul's). The aim of those who founded it was to represent the principles of orthodox Anglicanism, not only in theology but in politics and criticism. The paper soon worked its way to success and became the most popular "organ" of the English clergy. Through it the opinions of the careful, accurate students who sympathised with the movement became widely known. Through it began the influence of Church, whose knowledge and wisdom and strength came gradually to impress profoundly the most prominent of his contemporaries among statesmen as well as clergy. As parish priest and as Dean of St. Paul's he displayed the character of an English priest of the type of George Herbert or Lancelot Andrewes—learned, judicious, tolerant, saintly—in its most beautiful aspect. Firm in his convictions, filled with a noble enthusiasm for justice, and great in his quietness, no man ever represented more perfectly the characteristic excellencies of the Anglican Church.

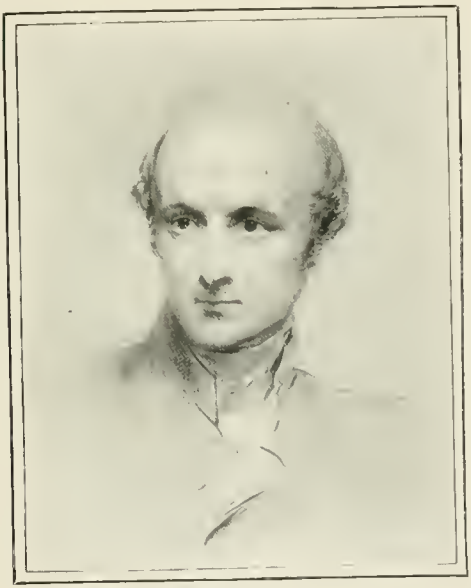
The Gorham Case.

From 1847 to 1851 the Church was agitated by a controversy on the doctrine of Baptismal regeneration as asserted in the Book of Common Prayer. In 1850 the Judicial Committee of the Privy Council, while declaring that it had no jurisdiction or authority to decide matters of faith, ruled that the doctrine held by a certain Mr. Gorham, and declared heretical by the Bishop of Exeter—the learned and combative Henry Phillpotts (1778–1869)—should be no bar to his institution to a benefice in that bishop's diocese. Phillpotts was a Tractarian before the Tractarians, a man of extraordinary polemic vigour and a ruler of indomitable determination and masterfulness, and he fought the battle, as he deemed it, of orthodoxy till the end. The decision of the lay court was regarded by many as a grievous scandal. It resulted eventually in the secession of several English clergymen to the Church of Rome, among them the learned Archdeacon Wilberforce, brother of the Bishop of Oxford, and his brother-in-law, Archdeacon Manning.

Manning had been an active supporter of the Tractarians,

had adopted a violent animosity against Rome, in which he could not induce Pusey to join, and, eventually, after years of doubt and hesitation, passed, when he had become more and more suspected by English statesmen and cut off from preferment, into the Roman communion. Secessions to Rome.

While this controversy harmed the Church in one direction it was indirectly a source of benefit. It made Churchmen see



ARCHDEACON, AFTERWARDS CARDINAL, MANNING.
*(After G. Richmond, R.A.)*

the absolute necessity for some definite expression of Church life, and it thus greatly aided the revival of Convocation and the restoration of its powers, warmly advocated by Bishop Wilberforce and Bishop Phillpotts.

Meanwhile a new school (of which more will be said hereafter) was rising. It represented on the one hand those who distrusted all formularies and valued comprehension rather than cohesion in the Church, on the other those whose studies of German theology had led them to proceed far beyond most Englishmen of their day in the direction of criticism of the Bible and of Church principles. In 1860 a volume of "Essays The Broad Church.

Essays and Reviews.

and Reviews" was published. It was the work of several writers who were in not a few matters in far from close agreement with each other, but who wished to see a more liberal interpretation of the Church's formularies and a fuller appreciation of the results of modern investigation, scientific and historical. Among them were men so unlike each other in opinion and in tone of mind as Mark Pattison, a learned but somewhat crabbed scholar who had undergone a violent

BENJAMIN JOWETT, BY GEORGE RICHMOND, R.A.
(*Balliol College, Oxford.*)

reaction from Tractarianism, Benjamin Jowett, a shrewd and kindly teacher of young men, and Frederick Temple, a strong schoolmaster and a sincere and devoted Churchman of moderate views. While Pattison and Jowett remained in Oxford to the end of their lives, the latter exercising a remarkably wide influence outside through the men of mark whom he had trained, Temple, in spite of much opposition which gradually yielded to the force of his personality and his goodness, rose to be Bishop of Exeter, and then of London, and eventually (in 1896) Archbishop of Canterbury. "Essays and Reviews" took what were considered in 1860 to be very wide and unorthodox

1865]

views of important theological questions It caused great excitement, was condemned by bishops, answered by an archbishop, and forgotten. The long discussion to which it gave rise served only, in the end, to show the breadth of the English Church. The Broad Church, or Latitudinarian, School flourished in spite of the persecution of some of its members It afforded a resting place to those who had neither time nor inclination to study deep theological or philosophical questions,

*Photo: Walker & Cockerell.*

BISHOP COLENSO, BY SAMUEL SIDLEY.

(*National Portrait Gallery.*)

or whose charity abhorred the restraints of definition. Above all, in practical philanthropy on an "unsectarian" footing, and in warm welcome of the democratic movement of the age, it filled an important place in the history of the time.

As the Tractarian school lost its weaker disciples by secessions to Rome, so the Latitudinarians, though for obvious reasons less readily, lost several members who became Unitarians. The strength of this sect was due to a number of powerful minds which directed it, and not least to the eminent philosopher and devout philanthropist, James Martineau.

Bishop Colenso.

The storm raised by "Essays and Reviews" was felt outside England. It was complicated by a serious trouble in the Church of South Africa, where Bishop Colenso, of Natal, well known as a mathematician and as a friend of the native races, but of whom Disraeli said that his theological studies had begun "after he grasped the crozier," was excommunicated for persistence in opinions in regard to the Bible which were adjudged heretical by the Bishop of Cape Town, whose action was approved by the Convocation of Canterbury.

Church Courts.

While questions such as these profoundly agitated the Church there was grave discontent with the unsatisfactory and unconstitutional position of ecclesiastical judicature. The Convocations were allowed to sit again from 1850, and did extremely valuable work; but from 1833 the powers of the Court of Delegates, which had enjoyed the appellate jurisdictions in ecclesiastical cases since the Reformation, were in the hands of the Judicial Committee of the Privy Council, a lay court which was in several respects unfit, even if competent, to try such cases as were now being brought before it. The Church, it seemed, was allowed to speak for herself, though she was not often listened to, but her laws must be interpreted by laymen. The position was sure to lead to acute difficulties.

H. D. TRAILL. Literature.

For the first ten years of the period on which we are now entering, the poetic stage was not only dominated but almost exclusively filled by the great figure of Alfred Tennyson. Though he was now verging upon forty, and had long since acquired and displayed the highest mastery of his artistic instrument, yet his recognised eminence in the world of letters was not yet equalled, or nearly equalled, by his popularity in the larger world outside. Had his career been cut short at that date his place as a poet of the first rank would have been secure to him in the history of English literature: but he would not have gone down to posterity as pre-eminently the national poet of the Victorian Age. For though perfection of form can be no less, perhaps even more, commandingly brought home to the critical appreciation in short than in long poems, it is only on the larger scale of composition that the matter of great poetry ever impresses itself on the mind of that vast majority of man-

Tennyson's Second Period.

kind to whom poetic form is an indifferent, if not an unintelligible, thing. In 1846, Tennyson had written no single poem of more than a few hundred lines in length. Between that year and 1858 he had published four volumes, each containing a separate and substantive poem, three out of the four numbering several thousand lines, and two of them containing some of the poet's most serious, most deeply-felt, and for the mass of his countrymen, therefore, his most memorable work.

These four are "The Princess" (1847), "In Memoriam" (1850), "Maud" (1854), and "The Idylls of the King" (1858). The first, a work of pure fantasy, so far as regards the plot of the "Medley," to use its author's name for it, but with a thread of now somewhat outworn social satire interwoven with its romantic fable, is hardly to be ranked as a whole among the strongest of Tennyson's performances. He is never, indeed, at his best in poetry of the lighter order. "Alfred, whatever he may think, cannot trifle," said his friend Fitzgerald of him: and there was a certain amount of truth, which "The Princess" illustrates, in the criticism. The poem nevertheless abounds in descriptive passages of exquisite beauty, and is starred with lyrics which the poet has nowhere excelled. "Maud" divided opinion even more, and, perhaps, even more justly. Its tone is somewhat jarring; its hero, always unsympathetic, at times almost declines into a mere sulky lout; and although it contains at least one unsurpassed utterance of passion, the passage beginning: "I have led her home, my love, my only friend," a lyric which would alone rank its singer among the great love poets of the world, the poem as a whole must be admitted to contain a larger alloy of rhetoric to a smaller amount of the pure gold of poetry than any other equal number of Tennysonian lines. It was with "In Memoriam" and "The Idylls of the King," that the Laureate (for in the year of the publication of the former of these poems he succeeded Wordsworth in that dignity) touched his highest point of achievement during this period of his career. Too long for an elegy—nay, too long, perhaps, for artistic perfection, if considered as a single continuous poem—"In Memoriam" abounds with detached passages of the finest poetry, giving final and monumental expression to some of the deepest emotions of the universal human heart. And modernised though they are from the Arthurian Epic,

"The Idylls of the King" combine a noble elevation of feeling and a splendid movement of romantic narrative with such a mastery of the blank verse measure as had been unknown to English poetry since the days of Milton.

The Brownings.

Browning, not yet established in popularity, though strengthening the foundation of his future fame by work so admirable as "Christmas Eve and Easter Day" (1850), "Men and Women"

*Photo: Walker & Cockerell.*

ROBERT BROWNING, BY FIELD TALFOURD.

(*National Portrait Gallery.*)

(1855), and "Dramatis Personæ" (1864), was probably in those years known by name to far fewer people than was his future wife, Miss Elizabeth Barrett (1809–61), who had published a volume of "Poems" in the first year of this period, and another in 1850, containing most of her best work. Two years later appeared "Casa Guidi Windows," and the longest and most ambitious of her works, "Aurora Leigh." It was not till eight years later, in 1860, the year preceding her death, that she published "Poems before Congress": and a volume of "Last Poems" appeared posthumously in 1862. The poetesses of the world form a company so small that the retrospective eye is

1865]

hardly arrested till it reaches the shadowy and fragmentary Sappho; and to vote a niche to Elizabeth Barrett Browning in so nearly empty a temple may seem but a doubtful honour. Moreover, her admirers need not fear, nor her severest critics demur to, a comparison of her poetry with that of all but one or two of her masculine contemporaries. The technical defects of her verse are numerous and occasionally flagrant, and her literary

*Photo. Walker & Cockerell*

ELIZABETH BARRETT BROWNING, BY FIELD TALFOURD.
(*National Portrait Gallery.*)

taste was far from irreproachable; but she had a passionate sense of beauty in all its forms, and she sounds at her best moments a note of thrilling and poignant pathos which not many poets of her own or any time have matched.

Matthew Arnold.

In the year 1849 there appeared a volume of verse, entitled "A Strayed Reveller, and Other Poems," and signed only by an initial letter, which contained the first fruits of a poetic genius of the rarest quality, if somewhat limited in range, and all too brief in the period of its productive activity. It was followed four years later by a volume of "Poems" from the same hand, and this time disclosing its author's full name, which, if it did not at

once secure, has together with later productions secured him in the estimation of capable critics a unique place among poets of the Victorian Era. It may be said, indeed, that in Matthew Arnold (1822–88) we have, perhaps, the most perfect specimen of the classic style that the essentially Romantic bent of nineteenth-century English poetry could allow to exist and flourish

MATTHEW ARNOLD, BY G. F. WATTS, R.A.

(*National Portrait Gallery, by permission of Mr. F. Hollyer.*)

in our literature. It is a style which, as its judicious admirers admit, has, in modern hands at any rate, its weakness as well as its strength; and in the hands of Mr. Arnold the former quality was now and then more conspicuous than the latter. It betrayed him sometimes into a stiffness with which another and greater classic, Milton, is himself on occasion justly chargeable, and sometimes into a frigidity of which Milton is much more rarely guilty. But when, as in "Thyrsis," the noble memorial poem to his friend Arthur Hugh Clough (1819–61)—himself a writer of considerable but unequal poetic merit, to whom this brief refer-

ence must suffice—the younger elegist is at his best, there is an austere and melancholy beauty in his strain of lament which raises it very nearly to the level of the elder poet's "Lycidas." The classic chill, however, is even more noticeable than the classic correctness in Arnold's "Merope" (1858), an English drama in the manner of Greek tragedy, and its failure is the more conspicuous because it preceded by only a few years the less accurately Attic, but far more brilliant effort in the same order of imitative poetry, the "Atalanta in Calydon" of Mr. Swinburne.

Pre-Raphaelitism.

It would be premature, however, to examine the work of this last-mentioned poet, the originator and inspirer of a new spirit into English poetry, until due account has been taken of a movement by which he himself was no doubt in some measure affected, but which was more directly represented by another and somewhat earlier singer. The formation of the Pre-Raphaelite Brotherhood, related (p. 408) in more detail in another section of this chapter, had in the first instance an artistic rather than a literary origin. It was in art, at any rate, that it first found noticeable expression. But the most striking feature in the movement—its passionate medievalism of spirit—was very soon to assume the same prominence in literature. There is little doubt, for instance, that though Tennyson was never directly affiliated with the Pre-Raphaelite School, it was the influence of their ideas "in the air" that turned his attention to the Arthurian Epic. But it was far more potently the inspiration of William Morris's (1834–96) "Defence of Guinevere," a poem which is saturated with the spirit of Malory's prose epic, and showed plainly that, in the work to which the elder poet had only gone for the original of a "Christian hero" and a body of texts for high discourses on the masculine virtues, his young successor had found a whole congenial world of life and movement, action and passion, colour and pageant—all, as picturesque and poetic as could be wished, but as completely dissociated from the domestic virtues of the nineteenth century as could be conceived. Nor can the inspiring effect of the movement upon the genius of Mr. Swinburne and so upon the whole poetic tendency of the generation which he has so powerfully influenced, be overlooked. The second, and, perhaps, the most famous of this poet's works, the "Poems and Ballads," was,

William Morris.

A. C. Swinburne.

however, published in 1866, a year after the close of this period, and our brief survey of his important relation to the poetry of the second half of the century may most conveniently be deferred to the next chapter, wherein also the work of Dante Gabriel Rossetti, a no less truly begotten son of the movement than William Morris, may be concurrently reviewed.

"Owen Meredith."

Among the minor poets of the period the foremost name, perhaps, is that of "Owen Meredith," the pseudonym under which Edward Robert Lytton (1831–91), only son of the novelist and poet Edward Lytton Bulwer, whose work was noticed in the preceding chapter, gave his first poems to the world. His later performances did not quite fulfil the promise of his youth; but he had a true though intermittent lyrical inspiration, and some of his efforts in half-serious allegory and symbolism show a remarkable mastery of that peculiar form. It remains only to give a few words of notice to a curious and deservedly fleeting movement originating with a small school of young poets appropriately designated by the word "Spasmodic." The joint founders of this school—for in the difficulty of distinguishing between leader and follower they rather resemble the Adullamite party in Mr. Bright's memorable description of them—were Alexander Smith (1830–67) and Sydney Dobell (1824–74). The latter, though he probably had more of the "root" of the poetic matter in him than his colleague, failed to achieve any great popularity; but the former, for a few years after the publication of his most important poem, "A Life Drama," became the rage. There are periods in the history of all the arts when the public seems to tire for a while of its old and well-established favourites, and to seek perversely enough for some one to supplant them; and during the interval between "Maud" and "Idylls of the King," Alexander Smith stood in much the same relation to Tennyson as "Master" Betty stood at an earlier date to John Kemble. He was the "young Roscius" of poetry, who, after being temporarily elevated to the same, if not to a higher pedestal, than that of its greatest living master, is now as clean forgotten as his dramatic prototype. It would be unjust to compare him, except as the object of exaggerated admiration, with the school of Della Crusca (Vol. V., p. 600); but a comparison of Gifford with William Edmonstoune Aytoun (1813–65) is more apt. For the "Baviad" and "Mæviad" were not more fatal to

The "Spasmodic" School.

1865]

the Della Cruscans than was the admirably humorous burlesque of "Firmilian" to the Spasmodic school. Alexander Smith's pretensions to poetic merit were, however, immeasurably superior to those of another favourite, whose popularity was far more enduring, and whose permanent hold upon a large public of readers renders it expedient to defer the works of

*Photo. Walker & Cockerell.*

GEORGE GROTE, BY T. STEWARDSON.

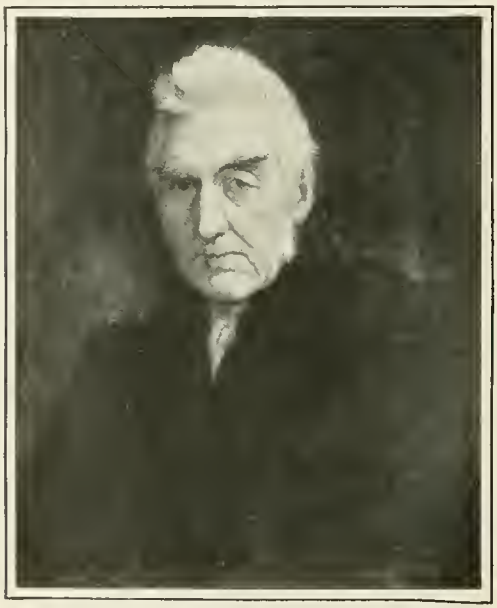
(*National Portrait Gallery.*)

Martin Farquhar Tupper (1810–89) for consideration in that general review of the literature and literary tendencies of the age which is reserved for the closing chapter of the present volume.

Prose: Historians.

In poetry, as has been seen, the period, though one of fruitful activity, was at the same time to some extent also a period of transition and tentative effort. For the rich and steady development of English literature upon established lines we must look to the department of history. The quarter of a century from 1840 to 1865 was singularly distinguished in the production or commencement of memorable historical works and the foundation or coronation of edifices of historical fame.

Macaulay's magnificent fragment of a history of England belongs, as noticed in the preceding chapter (p. 216), to the period; and to it belongs also the completion of what is still the best history of Greece, by Bishop Thirlwall (1797–1875), a writer of much learning, no mean literary skill, and strong liberal prepossessions controlled by an admirably judicial mind; and the rival work on the same subject by George Grote (1794–1871), which, though



HENRY HART MILMAN, BY G. F. WATTS, R.A.
(*National Portrait Gallery.*)

wanting alike in the style and the scholarship of Thirlwall's history, and too often declining in its political disquisitions to the level of a mere Radical pamphlet, yet by the animation and graphic power of its narrative deserved at least some measure of the popularity which it obtained (p. 663). In 1856 H. H. Milman (1791–1868; afterwards Dean of St. Paul's), a disciple, imitator, and editor of Gibbon, published the "History of Latin Christianity," the worthiest of his works; and in the same year appeared the first volume of that history of England, from the "Fall of Wolsey to the Defeat of the Armada," which, when

completed in 1869, was to establish the position of James Anthony Froude (1818–94) as one of the greatest prose writers of the Victorian Age. And, lastly, it was in the middle of this period that Carlyle entered upon that herculean labour which was to engage, and indeed for all practical purposes to exhaust, the energies of his latter years, the "Life of Frederick the Great."

Passing from historic to imaginative prose, we find no abate-

*Photo: Walker & Cockerell.*

W. M. THACKERAY, BY SAMUEL LAURENCE.

(*National Portrait Gallery.*)

ment of the brilliancy of achievement which signalised this remarkable period of the mid-century in every department of literature. Between 1846 and 1865 there flourished no fewer than seven novelists, of whom two, Dickens and Thackeray, rank as undisputed classics; two others, Charlotte Brontë and George Eliot, have in the opinion of many established their claim to that title; while the remaining three, Charles Reade, Charles Kingsley, and Mrs. Gaskell, without exactly attaining classic rank, undoubtedly achieved a nearer approach thereto than was to be accomplished by any later English novelist for

Novelists.

Thackeray.

well-nigh another generation. But the eleven years from 1846 to 1857 are principally famous as the flowering time of Thackeray's genius. The first year of the period witnessed the commencement of his masterpiece, "Vanity Fair"; in the last he began "The Virginians," a tale of the eighteenth century, which would stand higher among his works were it not thrown into the shade by "Esmond," the wonderful novel published a few years earlier, of which it is the sequel, and in which Thackeray, with an imaginative power never surpassed even by Scott, and with an accuracy of historic detail of which Scott was too often careless, has reproduced for us the statesmen and soldiers, the wits and beaux, the poets and pamphleteers of the reign of Anne. And when we remember that "Esmond" was only two years preceded by "Pendennis," and followed within three years by "The Newcomes," we must admit that never, save once before by his great rival, has the literature of English fiction received so rich an addition to its treasures within so short a space of time. With the single exception of "David Copperfield," published in the same year as "Pendennis," the greatest of Dickens's novels had already been given to the world; for "Dombey and Son," "Bleak House," "Little Dorrit," and the rest, though they of course show many traces of his mature power, show also no less visible signs of the waning of the spontaneous, and the waxing of the mechanical and mannered element in the novelist's work; while Thackeray's genius during these years was going from strength to strength. He did not, it is true, nor could he from the very nature of his subjects and their treatment, achieve so wide a popularity as Dickens. His appeal was mainly, if not quite exclusively, to the refined and educated class of readers; and it was among their interests and occupations that he sought the material of his art. He has left the field of the stronger and more primitive passions, the *votum, timor, ira*[1] of humanity, to others; and it is from the *voluptas, gaudia, discursus*—the pleasures, ambitions, pursuits of society, with the activities they stimulate, the weaknesses they foster, and the virtues which occasionally redeem them, that he collected the *farrago* of his books. But among these he moves a supreme and unapproachable master; the possessor of a far more limited domain than Dickens, but traversing it

[1 *i.e.* the passions of desire, fear, anger. The reference is to Juvenal I., 85.]

with a far surer foot and surveying it with a far more penetrating eye.

In the second year of our period an unknown writer published under the pseudonym of Currer Bell the remarkable novel "Jane Eyre," which at once excited the surprised admiration of the critical world. It was followed in 1849 by

The Brontës.

CHARLOTTE BRONTË.
(*After George Richmond, R.A.*)

"Shirley," and in 1852 by "Villette." When the secret of their authorship was revealed they were found to be the work of Charlotte Brontë (1816–55), the eldest of the three daughters of a Yorkshire clergyman, all of whom, though none of them lived to attain the age of forty, made themselves a name in literature; the second sister, Emily (1818–48), displaying in "Wuthering Heights" an amount of power which might perhaps, if she had lived, have carried her even further than Charlotte. As it is, however, her elder sister's remains the greater name, though the far less striking character of her

second and third efforts, as compared with her first, suggests the reflection that, brief as was her life, its brevity may not have ill-served her reputation. "Jane Eyre" is after all but a glorified example of the "one novel" which everybody is said to "have in him." It is not quite certain that Charlotte Brontë had any more novels in her as great, or nearly as great, as "Jane Eyre:" at any rate neither "Villette" nor "Shirley" has proved it. But this suspected limitation in her range may not unreasonably be claimed by her admirers as additional testimony to that truth, force, and intensity of this personal and almost autobiographic utterance which has raised it to the rank of a classic. Even as it is, however, she owes something of her fame to the pious labours of her friend and biographer, Mrs. Gaskell (1810–65), herself, as has been said, a novelist who came not far short of greatness, and whose "Sylvia's Lovers," a finer work than her more famous novel of "Mary Barton," is one of the most powerful and moving stories in the whole literature of English fiction.

Mrs. Gaskell.

George Eliot.

A far more widely ranging imagination, coupled with a broader and more philosophic view of life than Miss Brontë's and relieved by a wealth of more genial humour than the somewhat acrid satire of Currer Bell, distinguished the genius of Marian Evans (1819–80), who under the literary sobriquet of George Eliot wrote her first and perhaps most famous novel, "Adam Bede." Its remarkable excellence was so immediately and so generally recognised that at least one ambitious admirer of it paid the authoress the most sincerely flattering tribute within his power to render by claiming her work as his own. It was followed two years later by "The Mill on the Floss," a novel of almost equal beauty and power, and in yet another year by the brief but admirable little idyll of "Silas Marner," in an artistic sense, perhaps, her finest work. "Felix Holt" was a less happy effort, and "Romola," a story of the Italian Renaissance, was, like George Eliot's poetry, an exercise on an instrument over which she had not the perfect mastery that she had elsewhere displayed. "Middlemarch," published in 1871, showed her once more at her best: but from that date the influence of her long association with George Henry Lewes (1817–78), a man of immense intellectual versatility as dramatist, journalist, critic, biologist, and popular historian of philosophy,

G. H. Lewes.

1865]

began to show itself in a disastrous substitution of the scientific or pseudo-scientific for the poetic and artistic view of human life, and in a correspondent and consequent depravation of one of the purest and most distinguished of later prose styles. Partly on this account, and partly through mere change of

GEORGE ELIOT, BY SIR FREDERICK W. BURTON, R.H.A.
(*National Portrait Gallery. By permission of Henry Burton, Esq.*)

fashion, the fame of George Eliot has undergone obscuration, amounting almost to occultation, since her death: but the eclipse is almost certainly only temporary. A novelist of great imaginative gifts, and a not inconsiderable poet, not only attained popularity, but even the high respect of criticism during this period in the person of Charles Kingsley (1819–75), a position approached, but not quite reached by his brother Henry (1830–76), a writer of distinctly lower literary merit, but of no little force and fascination as a story-teller, especially of Australian life. Neither of them, however, deserved the fame

The Kingsleys.

Charles Reade.

which should have been, but never was, awarded to Charles Reade, a romancer of true genius, whose "The Cloister and the Hearth" was by far the most inspired revival of a bygone European period accomplished since Scott. During most of the years when Reade's supremacy might and should have been recognised the first place in popularity was given to Anthony Trollope, a writer whose great vogue, as being one of the characteristic phenomena of the century, is reserved for examination in our concluding chapter.

THE TINTED VENUS, BY JOHN GIBSON, R.A.

F. G STEPHENS Artists of the Middle Victorian Era.

At the date with which this part of our narrative begins painting of the more ambitious sort, as it was practised in these islands, was, apart from a considerable improvement as to its technique, and except as regards landscapes, very much as it had existed when Reynolds left it more than half a century before. In the interval Turner (whose life-work belongs to an earlier period), Constable, and Bonington (pp. 49, 53, 67) had, indeed, revolutionised landscape art, not only in England but in France, where the influence of the second of these masters was so prodigious that the superb and resourceful school of that country as it still exists is due to him. As concerns subject- or figure-painting, as well as landscapes, to Bonington all the world was, and still is, very much indebted. His great contemporaries, Delacroix and Delaroche, had in him an invaluable ally, who, being a worthy follower of the Magnificoes of Venetian design, helped with them to refound the inaptly named "Romantic School." What is called anecdotic painting, and the representation of

historical themes, came into vogue in the light of these modern leaders. The glorious mark of Flaxman was deeply set upon English sculpture; Chantrey, who died in 1842, was still potent in the same line; the influence of Gibson was indirect and losing force. Our best sculptor was Richard James Wyatt, whose "Penelope," "A Huntress," and "Ino," a Greek might boast of,

BACCHANTE AND CHILD, BY R. J. WYATT.

if, like Wyatt, he had lived and died in the Eternal City. The representation of beauty, and the divine tranquillity of the Hellenic mood, not the illustration of anecdotes, and still less of passion, were desiderata of the art of Gibson, Wyatt, M. L. Watson—whose "Sarpedon," "Eldon and Stowell," and "Chaucer" endure any comparisons—McDowell and Woolner. These were the masters of the period now to be considered Woolner, in 1846, had not yet made himself known. The architects of the day were the accomplished Cockerell, the

Art in 1846.

masculine Hardwick the elder, the passionate and learned younger Pugin, and the first Barry. The engravers proper were John Pye, C. Turner, S. Cousins, and J. T. Willmore. Lithography and etching were hardly flourishing. There was not much to say about wood-engraving; "processes" were nowhere; and miniature painting was in a good way, chiefly in the hands of those capital workmen, Ross and Thorburn.

THE KNIGHTING OF HENRY ESMOND, BY A. L. EGG, R.A.
(*National Gallery of British Art.*)

Painting.

As it is to painting that this essay must needs principally refer, it will be well to see how it stood in the hands of the above-named leaders. It will be remembered that the stupendous powers of Millais and Ruskin had yet to emerge, that Haydon had already, so to say, discounted himself, and that Wilkie, most of whose Spanish pictures were disastrous, was recently dead, although the effect of his success as a painter of anecdotic genre was encouraging to those who worked in the same vein of design. Mulready (p. 64) had become rather an object of admiration than a model for imitation. Leslie (p. 64), the ablest and best designer of genre, the subtlest delineator of beauty of the modern strain and what may be called Englishness then living, had twenty years before won high honours with

MALVOLIO AFFECTING THE COUNT, BY DANIEL MACLISE, R.A.

*(National Gallery of British Art.)*

"Sancho Panza in the Apartment of the Duchess," "The Dinner at Page's House," and a few other gems which careless observers have not half enough admired. G. S. Newton, with some of the powers of Bonington, his model, and a weaker grasp of character, colour, and drawing than Leslie, died in 1833. Augustus Leopold Egg stood very high among the genre painters, and in 1844 had advanced his reputation by exhibiting "A Scene from *Le Diable Boiteux*," which is now in the Vernon Gallery; his masterpieces —"The Knighting of Henry Esmond," which occupies a space between a very good Leslie on the one hand, and, on the other, a true Pre-Raphaelite picture, and "Peter the Great and Catherine" —were yet to come. Among the second-rate men of the decade preceding 1845 stood Calleott, an excellent, though rather tame, artist in landscape as well as in genre painting; Collins, whose art had a sort of freshness we cannot discover in Calleott's: and the vigorous and unequal John Varley, Mulready's and William Hunt's master. Their fellow-pupil, John Linnell (p. 57), still flourished grandly, and was, perhaps at his best. John Martin (p. 60)—whose influence upon Poole and F. Danby, both masters of poetically inspired landscape art, was greater, or at least more durable, in that respect than in his own case—died mad in 1854; and his "Zadak in Search of the Water of Oblivion" remained as the finest illustration of a manner which it is not just to call merely scenic.

Etty (p. 68), now in his fifty-eighth year, and soon to pass away, was a master whose sterling originality and sumptuous colouring will, it is to be hoped, again win honours for him when the historical mood of later judgments no longer vitiates the public taste. Maclise (p. 231) had more than justified the hopes built on his "Malvolio affecting the Count," now in the National Gallery. He had, before 1845, produced "Captain Rock," "The Banquet Scene in *Macbeth*," and "The Play Scene in *Hamlet*." Dyce's scholarship, stringent science, and bright, pure colouring, in addition to his fine draughtsmanship, were holding their places in the Academy and elsewhere; he had taken high honours in that famous Westminster Hall Exhibition of 1843 which astonished the world, and with C. W. Cope as his equal and colleague, was already an A.R.A. Stanfield (p. 232) was at his best. In water-colour painting, artists' knowledge of light and splendid colours had been prodigiously advanced by Turner

and a few others; among its professors the most original and powerful were David Cox (p. 71), J. F. Lewis, and William Hunt. Each of these men painted from nature as he found it, studiously, unflinchingly as to labour, and with such brilliant hues and such wealth and force of light as no Englishman had till then ventured upon; accordingly the little gallery of the old Water Colour Society was fairly illuminated by their works. In his

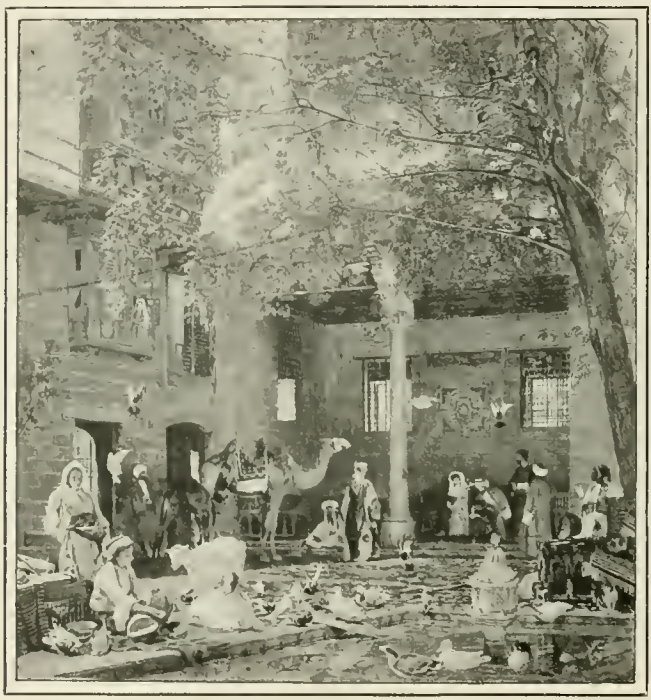
THE CURFEW BELL, BY SAMUEL PALMER.
(*Victoria and Albert Museum.*)

way their compeer was Samuel Palmer, whose grave inspiration and noble and stately powers were dominant in 1845.

Anticipations of Pre-Raphaelitism.

It is not without a purpose that these sumptuous colourists, searching draughtsmen, and indefatigable students of nature are here grouped. In these respects their achievements were not only honourable to the artists, but they rendered the advent of the Pre-Raphaelites—that greatest phenomenon of the period here contemplated—a somewhat less startling affair than it must otherwise have been. In fact, Etty's painting of the carnations, and his skill in depicting what the Italians call the *morbidezza* of "the life," were a great deal higher in key, purer and truer than the British public had before his time any knowledge of. Maclise's firm touch, his dignified, if some-

what histrionic, motives and laborious modelling were almost Pre-Raphaelite; the same may be repeated of the research of Dyce and his brilliancy, to say nothing of the profound earnestness of his mood, as all these qualities were manifest in "Joash Shooting the Arrow of Deliverance," which was at Trafalgar



THE COURTYARD OF THE COPTIC PATRIARCH'S HOUSE IN CAIRO, BY J. F. LEWIS, R.A.
*(National Gallery of British Art.)*

Square in 1844, and is a picture the best Pre-Raphaelite Brother would be proud to own. Cope, at the period in question, exercised an unusual sense of style which all the "Brethren," if they did not imitate it, enjoyed greatly. The naturalism, the splendour, and the completeness of Cox, Lewis, and William Hunt, combined with their inexhaustible patience and fidelity, went far to support the theory of Pre-Raphaelitism; while the largeness of the style of the last named "great master in small,"

1865]

was such as the "Brethren" one and all could never praise too highly. In fact, Hunt was as much a Pre-Raphaelite as any artist of his time and training, his powers, and his idiosyncrasies could be expected to become; while it is easy, when characteristic

THE MONK, BY WILLIAM HENRY HUNT.
*(Victoria and Albert Museum.)*

Lewises, Coxes and Hunts are compared with the early works of the Brotherhood, to see how very much they all possess in common and how closely they resemble each other.

Before considering Pre-Raphaelitism at length we must take an account of that series of exhibitions which, designed not less

Art in Westminster Hall.

to promote fine art than to prepare for the decoration of the new Houses of Parliament, was held at Westminster Hall in 1843, 1844, 1845, and 1847. Cartoons, *i.e.* large drawings in chalk, intended to show the poetic and dramatic inspirations of the authors as well as to attest their technical attainments, had been called for, so that half the ambitious artists in England were on the *qui vive*, and their utmost energies developing. The result of the competition was surprisingly great, and the merits of a large number of the works sent in were incontestable. Out of

1843

the medley which, in 1843, ensued, Fame continues to refer to the contributions of E. Armitage, G. F. Watts, C. W. Cope, and H. J. Townsend, which showed not only hitherto unknown powers of designing figures on a large scale, but quite unexpected veins of poetry and energy. It was evident that, whatever our Continental neighbours might think, England was not, as to art of the higher kind, sunk in chaotic darkness. There were present, too, it must be owned, not a few marvels of badness. The surprise which attended the exhibition of these pieces arose from their affirming the designers' powers in drawing life-size figures, which is very different from delineating them on smaller scales, and was till then but rarely practised in England. Next to the acquisition of the Elgin Marbles (p. 666), no artistic event was more important than this gathering of exercises in the higher ranges of art. Possession and study of these treasures of the Parthenon have been incalculably beneficial to English art in all its forms, because in them we have standards nobler than were known before; and in the opinion of the present writer the result has been so truly commensurate to their merit that not even the foundation of the National Gallery is of so great importance.

Having named the more eminent contributors to Westminster Hall in 1843, it will suffice to say that all these artists, and the majority of those whose names follow here, aimed at succeeding in respect to style. This, since Romney's and Reynolds's deaths, had not obtained the attention which is due to so precious an element of art, an element so important that to their neglect of it may be attributed, first, some of the troubles which beset the Pre-Raphaelites, and, secondly, the large measures of success which attended their art when, in a more advanced stage, they freely used power of this nature.

The second exhibition in Westminster Hall was held in 1844, and consisted largely of paintings in fresco and oil, as well as cartoons and sculptures; it showed how much had been gained by the efforts of the preceding year. Among the leading examples were a cartoon of "Ophelia," an encaustic painting and a fresco by E. Armitage, the powerful painter of "Aholibah," who survived until May, 1896; C. W. Cope's fresco of the 1844.

THE BODY OF HAROLD BROUGHT TO THE CONQUEROR, BY F. MADOX BROWN.
(*A Cartoon: South London Art Gallery.*)

"Meeting of Jacob and Rachel," a fine piece lovers of art ought not to forget; a cartoon by J. Cross, whose "Death of Richard Cœur de Lion," now in the House of Lords, is a masterpiece too long overlooked, if not forgotten; Maclise's fresco of "The Knight," a work showing the metal the painter was made of; a graceful fresco of "Love," by Egg, and three extremely masculine works by F. Madox Brown, among them being the cartoon of "The Body of Harold brought to the Conqueror," a numerous composition of life-size figures, the transcendent merits

of which led to its being bought by public subscription and given to the South London Gallery, where, being perhaps the sole relic of the exhibition of 1844, it now hangs honoured and conspicuous. There were no premiums on this occasion.

The Academy, 1845.

Before the next gathering at Westminster was complete the Academy of the year 1845 had contained Etty's voluptuous and beautiful "Aurora and Zephyr," Mulready's fine "Sketch," Stanfield's "Sawmill at Saardam," Turner's "Whalers" (two), his lovely paradisical day-dream, "Venice, Evening: Going to the Ball," which is now, alas, a faded wreck, and its companion, "Morning: Returning from the Ball," pictures whose contrasting effects illustrated the artist's joy in nature and his knowledge of the enchantments of light and colour. With these were "Venice: Noon," by the same, and his "Venice: Sunset." Here was a magical quartet in landscape-painting such as no artist has surpassed. Leslie's "Scene from Molière" and "The Heiress"; F. Danby's "Wood Nymph's Hymn to the Rising Sun": E. M. Ward's "Lord Chesterfield's Ante-room," now in the Tate Gallery; Webster's "A Dame School:" Hook's "Song of the Olden Time," and Haydon's gigantic "Uriel and Satan"—these of more than a thousand paintings are all that remain in the critic's memory. They suffice, however, to show that England was by no means in a state of dire artistic poverty, and that her output in design was as various as it was fine. Westminster Hall in 1845 still further illustrated the power, progress, and growing resources of the English School; but beyond that, presented nothing further than its forerunners had called forth. Its noteworthy pieces were Maclise's "Spirit of Chivalry," Armitage's "Spirit of Religion," both since reproduced in the Houses of Parliament: Dyce's "Baptism of Ethelbert," of which the same may be said: Sir J. Tenniel's "Allegory of Justice," and F. Madox Brown's picture of the same theme.

Art in 1846.

The artistic phenomena of 1846—a year which is memorable because it witnessed the simultaneous *débuts* of painters not less important than Sir John Millais, Mr. Holman Hunt, and Mr. Alfred William Hunt—were works by many of the heroes of the previous season. There was no exhibition at Westminster, and the best things at the Academy were Maclise's "Ordeal by Touch," a fine instance, though conceived in his character-

istically "stilted" mood: Etty's "Grape-gatherers" and "Cornus"; Turner's "Angel in the Sun," "Returning from the Ball," and "Going to the Ball"; Landseer's "Stag at Bay," "Time of War," and "Time of Peace"; Cope's pathetic and pleasing "A Young Mother"; Mulready's "Choosing the Wedding Gown," a picture now in the National Gallery, and by some considered his masterpiece, which, too, being sold for the then amazing price of a thousand guineas, serves to mark

THE WHALERS, BY J. M. W. TURNER, R.A.
(*National Gallery.*)

another aspect of the matter in hand than that which has previously been looked at here; the "Desdemona" of Sir John Gilbert, Elmore's "Fainting of Hero," Stanfield's "Monnikendam," Dyce's Peruginesque "Madonna and Child," F. Danby's "Sunrise," Egg's "Buckingham Rebuffed," and E. M. Ward's "Disgrace of Clarendon," were the finer productions of 1846, so far as the more important public exhibitions were concerned. It is true that the British Institution of that year contained Turner's "Queen Mab's Cave," two landscapes by Linnell, and three minor works by Etty; but as these examples do not materially affect the summary here presented, it is not necessary to offer further particulars anent the artistic output of the

years immediately preceding the revolutionary movements of the Pre-Raphaelites.

Art in 1847. The final exhibition in Westminster Hall was held in 1847, and it resulted in the thorough establishment of the honours of several of our painters, whose skill was great, their genius potent, and their aims loftier than the average. Omitting the before-mentioned John Cross—who passed away not long after his "Death of Richard Cœur de Lion" obtained for him a premium of £500—it must be admitted that the gathering which brought into full light the powers of G. F. Watts, P. F. Poole, and E. Armitage (who were all prize-winners at the time) was indeed an epoch-marking one. Mr. Watts contributed a beautiful painted poem, in the chaste, sweet and yet severe, nude life-size figure of "Echo"; while his "Alfred inciting the Saxons to repel the Danes" was laureated. Armitage's "Battle of Meeanee" confirmed the opinions which were due to his honours already won in Paris and London. Mr. J. C. Horsley's "Henry Prince of Wales assuming his Father's Crown," a capital picture of its class, was shown at this time and place. William Linton exhibited his very "classical" "Ancient Greece" and "Paestum," and Millais sent that (for a boy, as he was then) truly wonderful "Widow's Mite," which was his first important effort. This group of well-designed and skilfully painted life-size figures was painted when the late P.R.A. was barely nineteen; some time afterwards the canvas was cut in half, of which one part remains in Europe, the other was taken to the United States. Foley's "Hampden," now in St. Stephen's Hall, was the most important sculpture. The other contributors comprised Sir W. Allan, Mr. T. S. Cooper, Mr. Eyre Crowe, Henry Dawson, a very capable landscape-painter whom Nottingham continues to boast about; Sir J. N. Paton, Mr. F. R. Pickersgill, H. O'Neil, Mr. W. E. T. Dobson, and Mr. J. Sant. An important outcome of the Westminster Hall Exhibition was a number of commissions given by her Majesty to some of our best artists, including Dyce, Landseer, Etty, Maclise, Leslie, Stanfield, and others, whom she employed to paint frescoes at Osborne and in the Garden Pavilion of Buckingham Palace. These works are supplementary to the more numerous and ambitious mural pictures at Westminster. The year 1847 at the Academy is memorable as having contained Millais's first serious

HONEYWOOD INTRODUCING THE BAILIFFS AS HIS FRIENDS, BY W. P. FRITH, R.A.
(*Victoria and Albert Museum.*)

effort, "Elgiva," the last of his pre-Pre-Raphaelite pictures, which was badly hung on high and in the half-darkness of the Octagon Room, and besides works whose distinctions have been already recalled to the reader's memory, several capital examples by John Linnell, whose "The Mill" is noteworthy as a good instance of his "middle manner," masculine, well-composed, and vigorously painted. It has been engraved. With this were Webster's "Village Choir," now the property of the nation; Etty's large "Joan of Arc" (two paintings), Mulready's "Burchell and Sophia," Egg's "Wooing of Katherina," Elmore's "Invention of the Stocking-Loom," engraved; Frith's "English Merry-making," and E. M. Ward's "South Sea Bubble," which is now in Trafalgar Square.

Masters of Early Victorian Art.

The reader who is familiar with our public galleries, or with those private collections which the owners generously throw open, will from the above statements easily form opinions of the art of half a century ago. He will remember the technical skill, insight into character, and somewhat commonplace humour of Mulready: the weaker geniality and rather "poor" manner of Webster: the sterling accomplishments, vigour, and affectations of Maclise (who had not then decorated the Royal Gallery at Westminster): the splendid exuberance of Etty, the finest flesh-painter of his time in England; least of all will such a reader forget the keen-edged humour, the satiric wit, freshness, and rare sense of the beauty of English women which distinguished Leslie's delightful illustrations of Shakespeare's and Goldsmith's comedies. Such observers as we address know how noble a landscape-painter was John Linnell; how admirable an *animalier*, as the French say, was Landseer: while painters will never omit to admire the triumph of Sir Edwin's handling and that brush-power of his, which was really an art, and not, as with the professors of *chic*, a mere handicraft. Mr. Frith's laborious though seemingly facile dexterity, his sparkling colours, his firm touch, and that sort of humour of his which is sure to be popular, are not to be overlooked, although in 1848 this R.A. had not reached the zenith of his world in painting "The Derby Day," or "Margate Sands." The art of Stanfield was not subtle, but it was sound, while its inspiration was sincere; he, too, had not yet painted his only pathetic sea-piece, which shows the catastrophe of "The Abandoned," a wrecked ship reeling in a

furious sea. The greater merits of Watts, Armitage, Poole, Madox Brown, Hook, J. F. Lewis, and some other later stars, were hardly known in 1847–48; Danby, E. M. Ward, Turner, W. Hunt, and one or two more had done, or were still doing, their best: while, on the whole, the state of art was anything but so

A SCENE ON THE TUMMEL, PERTHSHIRE, BY THOMAS CRESWICK, R.A.
(*Victoria and Albert Museum.*)

ignominious as too rash sciolists have accustomed themselves to pretend to think and to aver to those who know nothing about the matter. Such was the stage on which, or rather such the company of leading painters among whom a courageous and self-reliant body of tyros, inspired by lofty aims and a very intense enthusiam, were about to take parts of a quite novel sort, and, for

a time at least, carry everything before them. The weaker performers on the artistic stage, the Lees, Creswicks, Witheringtons, Howards, Robertses, Shees, Uwins, Westalls, and their like, are not mentioned here because most of them were simply the "walking gentlemen" of the profession, or mechanics of a showy sort; but several of these worthies, including Creswick, had "very pretty notions," and did not deserve the sneers and contumely hasty "modern" critics lavish upon them.

The Pre-Raphaelites.

The first glimpse the public had of Pre-Raphaelitism was, in the spring of 1849, obtained at the Hyde Park Gallery, and by means of Rossetti's "Girlhood of Mary, Virgin," a picture which attracted a great deal of attention, and not a little judicious praise, from the better-informed critics, while the "ruffians of the Press" were not sufficiently stirred by its novelty, nor by their taste, poetic feeling, or training able to appreciate its noble qualities. It was quite otherwise when the Academy opened in May, and unbelievers stood aghast and furious before Millais's "Isabella," the same which is now at Liverpool, and Mr. Holman Hunt's "Vow of Rienzi," both of which were in very honourable places. Then burst forth a chorus of censure such as London had never heard before. These pictures and their contumelious reception were due to a movement which, in the *London Review* of February 22, 1862, was thus described by the present writer as "A Confession of the Pre-Raphaelite Faith":—

"In the Royal Academy, where Millais had been an universal favourite, prophecies had been rife as to his professional success; however, all predictions and this applause referred to a very different order of merit than that which has since become peculiar to its possessor. About the year 1848 the propriety, or, as they declared, the absolute necessity, of the movement so well known as that of the Pre-Raphaelites was ardently discussed amongst the members of the youthful band which shortly afterwards banded themselves together as the 'P-R.B.' The Pre-Raphaelite Brotherhood declared that the system then most popular of producing art out of art itself alone, and, so to say, breeding in and in all mental efforts and practical execution, was not only entirely contrary to the practice of the truly great Old Masters—in proof of which they adduced the system of study followed by Leonardo, Titian, and a host of others—but that in this province of mental activity the same thing which experience has shown to hold good in physical laws would, and even did, they said, operate in annihilating individuality, the absorption of all true love of nature in conventionality, and in contaminating the stream of art at its very fountain-head

1865]

. . . [and would] produce a school of painters each generation of whom would be more effete, because more conventionalised, than that which preceded it, and to whose experience alone they looked for guidance. . . . Declaring that the followers of Raphael had ruined the art simply because they were followers of Raphael . . . . and reflecting, not without bitterness, upon the later practice of

AN ETCHING IN THE "GERM," BY W. HOLMAN HUNT.

the Prince of Painters, the P-R.B., with characteristic audacity, and with a seriousness which was half veiled in the fantastic assumption of the society's title, determined that their own works should show a different motive in art, and that they themselves, with all the powers and skill that were in them, would, whatever the consequences might be, pursue a practice widely removed from that of those whom they and all the world about them had been taught to respect or to imitate. Half in fun, the Brotherhood called itself 'Pre-Raphaelite,' adopting that title rather to express a full measure of admiration for the *motive* which guided the great painters preceding

Raphael than intending it to be understood, as critics of a dozen years ago [*i.e.* before 1862] received it, as chosen in approbation of the oftentimes fantastic, more often ascetic, and almost invariably imperfect systems of execution to which the undeveloped powers of the early Italian artists so cruelly limited their achievements on panels and convent walls. Considering how small were the attainments of the art critics of 1848, it is not surprising that they fell into this absurdity. Few of these men knew enough of the art they abused the public mind about to be able to recognise the real state of the case; still less could they comprehend the true qualities which shine through the most *bizarre* failures of execution, most of them due to over-earnestness and a devout desire to do right, which beset the ancient artists they ridiculed. Indulgence for youth of their own day, an enlightened and far-seeing regard of the importance of that which lay behind the most audacious declarations of the Brotherhood, were not to be expected from such men. A few only saw that something might come out of an idea so boldly enunciated, and, notwithstanding the vivid colours of its ridiculous side, sufficiently well expressed to have merited a gentler consideration than it received.'

When it is remembered that Millais was a Gold Medallist of the Royal Academy, and Mr. Hunt one of that institution's most robust and ardent students, it is difficult not to wonder why their technical accomplishments did not win the respect of the critics. At a somewhat later date, one of the Brotherhood thus, as repeated in the *Athenæum* (Aug. 15, 1896, p. 232), briefly wrote the apologia of his comrades:—

"Pre-Raphaelitism was neither more nor less than a protest of sincerity against the fatuousness of conventional art which ruled before its inception. It owed absolutely nothing but the example of sincerity to foreign or ancient artists of any kind; it illustrated that sincerity with greater devotion than any preceding mode of design, and produced nothing which is in the slightest degree like what had gone before it. Nor did the works and technical motives of the Brethren in any respect not controlled by this great rule of sincerity bear the least resemblance to each other. The effect of Pre-Raphaelitism on the practice of its professors was magical and revolutionary."

Such were the principles armed with which no less a person than Sir John Millais—who died President of the Royal Academy, and is universally acknowledged to be the greatest English painter of the Victorian Age—first appeared in the artistic arena. In the same way Dante Gabriel Rossetti, the world-renowned painter-poet, was bold enough to present himself. Thus Millais's fellow-martyr, Mr. Holman Hunt, was fain to come forth. Under the banner of Pre-Raphaelitism

Millais painted "A Huguenot," "Ophelia," "The Order of Release," and "The Proscribed Royalist." As the author of these splendid achievements the P.R.A. to be was, in 1853, elected an A.R.A. The list of Mr. Hunt's works is a record of primitive Pre-Raphaelitism but slightly modified by a larger experience. In Rossetti's "Ecce Ancilla Domini," which is now

"ECCE ANCILLA DOMINI," BY DANTE GABRIEL ROSSETTI.
*(National Gallery of British Art.)*

in the National Gallery of British Art, and half a dozen more fine things, is evidence of how strongly as well as stringently he adhered to those much misunderstood principles which another of the Brotherhood has set forth in the above-quoted terms.

Widening of Pre-Raphaelitism.

In a few years, of course, the stringency of the painters' enthusiasm being relaxed, and their views growing larger and wider—their public, too, having now been partly educated by them—such works as "The Vale of Rest," The Parable of the Sweeper," "Stella" and "Vanessa," "Chill October," "Mr. Hook,"

and a score more equally fine subject pictures, landscapes, and portraits came from Millais's easel. Of these it is right to say that they are, after all, as he was wont to declare on his own account, greatly due to Pre-Raphaelitism "writ large," and used with all the force and fire of the master's stupendous powers. Mr. Hunt has not "written himself" in so large and splendid a fashion, but he is still a faithful and important prophet. Nor were these Brethren the only two who, by pen and pencil, have been "faithful found."

It is not desirable or, within the space here available, possible to enumerate all the pictures of the category in question, which, according to the then new avatar, exercised so prodigious an influence upon English art that to this day its effect is every year visible on the Academy walls. It is not to be thought that only to Millais, Rossetti, and Holman Hunt is due the creation of such qualities as the best modern English pictures excel in; for example, grasp of the subjects selected, which includes vigour and freshness in design, brilliance of illumination, splendour, wealth and harmony of colouring, style in drawing, research in matters of costume, and care in delineating whatever is desirable for delineation. The noble works of Sir John Gilbert, Maclise, Hook, Dyce, John Phillip, J. F. Lewis, and others already named in this connection, attest that, within their time, our national school was already rich enough in these respects, although the number of men possessed of the qualities in question was comparatively limited, and even the best of them were not so thoroughgoing and enthusiastic as Millais, Rossetti, or Holman Hunt. It will be remembered, too, that a leading canon of the Pre-Raphaelite Brotherhood compelled its confessors to paint in the open air and as faithfully as they could; this, of course, ensured the extreme brilliancy of the local colours in their pictures, and consequent vividness in their coloration, or colour-schemes at large. Such qualities as these were not to be secured without finish of the highest kind and the almost complete evenness of the surfaces of the paintings. Lumps of opaque pigments, each casting its shadow and taking a sparkling light, obtained in pre-Pre-Raphaelite works, but would never do where choiceness, brilliance, and pure tints were indispensable.

While the then better-known members of the Brotherhood

THE VALE OF REST, BY SIR J. E. MILLAIS, BART., P.R.A.

*(National Gallery of British Art.)*

were enduring a ruthless persecution in public, and achieving large measures of renown, Rossetti was taking his part in the strife, but in quite a different manner, and, as suited his idiosyncrasy, addressing a small but choice and potent circle of men of light and movement. It was not, in fact, until his death many years after that the true position of the artist of "The Beloved" and "Proserpine," of "Dante's Dream" and a score more pictures of the highest art and rarest inspiration, was manifest to "the general," and Rossetti's unique honours as painter-poet and poet-painter were acknowledged as they are now. As he was, to all intents and purposes, an ally of the Brotherhood, to their names must be added that of the masculine, original, and resourceful Ford Madox Brown.

THOMAS WHITTAKER. Philosophy and Logic.

In the early part of the century general philosophy is represented on one side by the school of Common Sense (with Intuitionalist ethics), continuing Reid's reaction against Hume, and on the other side by the Associationism of James Mill (with Utilitarian ethics), which is a return to the English philosophical tradition. James Mill also worked out a scheme of political philosophy, dependent in a general way on Bentham's principles, but derived also from the study of Hobbes. One of the most noticeable movements is a revival of logical studies, and in particular a renewed direction of thought to the logical consideration of scientific method. This movement culminated, near the middle of the century, in the "Logic" of John Stuart Mill, the appearance of which marks the greatest epoch in the subject since Bacon.

The Association Theory.

James Mill (1773-36) came at first under the influence of Dugald Stewart. Thus he had his thought directed to psychology. This psychological direction the English tradition and the school of Reid have in common. The influence of Hartley, therefore, easily supervened upon that of Stewart; and James Mill, after Thomas Brown, continued the development of modern Associationism. In 1829 appeared his "Analysis of the Phenomena of the Human Mind." Here he consistently applies Hartley's view, that all association is "association by contiguity," to the analysis of complex intellectual and emotional states. The difference of Associationism, in this

developed form, from the scholastic psychology revived by Reid, is that it seeks to explain the phenomena of the mind by reducing them to cases of a single scientific principle, instead of being content to describe them as manifestations of so many "faculties" corresponding to the general names in ordinary use; compound images, for example, being described as expressions of the imaginative faculty, acts of reasoning as expressions of the faculty of judgment, and so forth. In philosophy proper, as distinguished from psychology, James Mill began to apply the principle of association to explain those beliefs which the Common Sense school regarded as "necessary truths," because incapable of resolution into anything simpler. These in his view, as developed by his son, became products of "inseparable association." Their formation is explained by the principle that some ideas are through frequency and strength of association so closely combined that they cannot be separated. Thus, although we cannot have one idea without the other, we can distinguish them in the complex product, and, by assuming them as elements, can explain the origin of that product.

James Mill's Political Science.

James Mill's most celebrated contribution to political theory is the article on "Government" contributed to the fifth edition of the "Encyclopædia Britannica." This was reprinted with other articles in 1828, and was the object of Macaulay's well-known attack. The "Fragment on Mackintosh" (1835) is a hostile criticism of Sir James Mackintosh's "Dissertation on the Progress of Ethical Philosophy," and is at the same time a defence of utilitarian ethics. The political theory of the article on "Government" will be referred to again when we come to John Stuart Mill. First, however, something must be said of the thinker who was the chief representative of the rival mode of philosophising.

Sir William Hamilton.

Sir William Hamilton (1788–1856) classed himself as of the Scottish school, but had also come under German influence, especially that of Kant. His essay on "The Philosophy of the Conditioned," which was contributed to the *Edinburgh Review* (1829) and is in form a criticism of Cousin, gave him at once a European reputation. His contributions to the *Edinburgh Review* were reprinted with large additions in the "Discussions on Philosophy" (1852). His well-known edition of Reid, with an unfinished series of dissertations on Reid's philosophy,

appeared in 1846; in 1854–5 he brought out nine volumes of a new edition of Stewart's works. Four volumes of "Lectures on Metaphysics and Logic" appeared posthumously ("Metaphysics," 2 vols., 1858; "Logic," 2 vols., 1860; edited by Mansel and Veitch).

Hamilton was remarkable for his copious philosophical learning; and many of his abundant ideas have been actively influential in the thought of the age. His most famous doctrines are those of "Consciousness" and of "the Conditioned." The doctrine of Consciousness is the form he gives to Reid's doctrine of Common Sense. The primary data of consciousness, when we have once arrived at them, are to be accepted as true. Among these primary data is belief in the existence of an external world independent of consciousness. Hamilton accordingly is a realist as against modern idealism. His metaphysical doctrine expresses itself in the "philosophy of the Conditioned." Of the "Unconditioned," whether called the Infinite, which is the "unconditionally unlimited," or the Absolute, which is the "unconditionally limited," we have no positive conception. We must speak of it, if at all, in negations. Between the two contradictory extremes we are unable to choose, though compelled to believe that one of them is actual. Thus all that we can, in the proper sense, be said to know lies in the intermediate region of the "conditionally limited," or the Conditioned. In both regions alike is manifested the law of the relativity of human knowledge.

John Stuart Mill (1806–73), the eldest son of James Mill, was trained by his father in the principles of his own philosophy; this training being the last stage of an elaborate education carried on from the earliest possible period. He was thus introduced to the writings of Thomas Brown, of Hartley, and of Hobbes, as well as to those of the Common Sense school. Later he came under the influence of Comte. Though he much resembles Hume in his general type of thinking, critics who have gone into the question are of opinion that he was very little influenced by Hume's writings, and perhaps did not know some of his most striking philosophical work. John Stuart Mill.

Mill's special greatness is in logic and in political philosophy. In logic he took up the philosophical problem of induction where Bacon left it. He himself had been carefully trained by

The Logic of Science.

his father in the traditional Aristotelian logic. Archbishop Whately's treatise (1826), which was an expression of the revived interest in logical studies, was the subject of an article by him in the *Westminster Review* (1828), where the germs of some of his later ideas have been detected. The most important part of Mill's logical theory, however, is not in any new interpretation of formal logic, but in the reduction of scientific thought to definite rules. His immediate predecessors in this were Sir John Herschel ("Discourse on the Study of Natural Philosophy," 1831), and Whewell ("History of the Inductive Sciences," 1837; "Philosophy of the Inductive Sciences," 1840). Whewell, in the "History," provided Mill with much of his material. So far as theory is concerned, it cannot be said that either Herschel or Whewell makes any very great step in the philosophical treatment of inductive logic. Both recognise the importance of Bacon's view, that induction must be methodical, not "by simple enumeration." Herschel illustrates Bacon's suggestions towards method from his own wide knowledge of actual science. Whewell in one point really corrects Bacon and, by anticipation, Mill also, when he concedes a larger share to hypothesis in scientific discovery. Mill's problem, however, was not to point out the way to scientific discovery, but to give a statement of the forms of proof by which we may know when scientific laws have been rightly inferred. It was the strictly logical, not what is sometimes called the "methodological," problem. What was almost or altogether wanting in Bacon was a philosophical basis for scientific induction.[1] The philosophical basis was supplied by Mill.

In this part of his work Mill's precursors were Hume and Comte. By Hume, as has been said, he was probably little influenced: but Hume had preceded him in the philosophical analysis of causation. Where Hume came short was in not systematically connecting this analysis with Bacon's idea of methodical induction as the means of establishing laws of

[1] Nothing can be vaguer than Bacon's doctrine of "forms." His predecessor Telesio comes nearer to an affirmation of the "uniformity of nature." See a passage quoted in Professor Fowler's Introduction to the "Novum Organum," 2nd edition, p. 95: "Sensum videlicet nos, et naturam, aliud praeterea nihil sequuti summs, quae, perpetuo sibi ipsi concors, idem semper et eodem agit modo, atque idem semper operatur."

nature. Hume was apparently most interested in applying his idea with a sceptical turn against the older notion of cause as an intelligible relation understood prior to experience. Comte, like Bacon, falls short in philosophical analysis; but he makes an advance on Hume by affirming more definitely that laws of nature, when we know all about them that we need to know scientifically, are simply statements of what uniformly occurs. The sceptical element in Hume's view recedes into the background, while its "positive" element is brought forward. Mill's work was to connect the philosophical analysis of "law" and "cause" with that idea of induction as proceeding through successively higher stages of generality which is due to Bacon. Through the advance of positive science that had taken place in the interval he was able to formulate better than Bacon the canons of scientific inquiry, while deriving them, as Bacon did not, from a fundamental axiom—namely, the uniformity of nature, especially as expressed in the "law of causation." As to the grounds on which this axiom itself is to be affirmed when we go into philosophical inquiries beyond those that are specially logical, Mill's view may or may not be accepted; but the necessity for such an axiom at the base of scientific induction is irrefragable. Mill's work in the logic of scientific inquiry into matter of fact is thus almost exactly comparable with Aristotle's in formal logic. After two centuries or more of dialectical thought, Aristotle explicitly stated the law of contradiction, and made it implicitly the basis of the syllogism. By his successors this law, with its equivalents—the laws of "identity" and of

WILLIAM WHEWELL, D.D.
(*Trinity College, Cambridge.*)

"excluded middle"—was laid down for didactic purposes as the fundamental law of all consistent thinking. Similarly, after more than two centuries of systematic experimentalising, Mill stated the fundamental axiom or postulate of scientific logic in such a way that, by means of it, he was able to formulate and reduce to order the "canons of induction" corresponding to the methods of experimental inquiry actually used by men of science.

**Mill's Influence.**

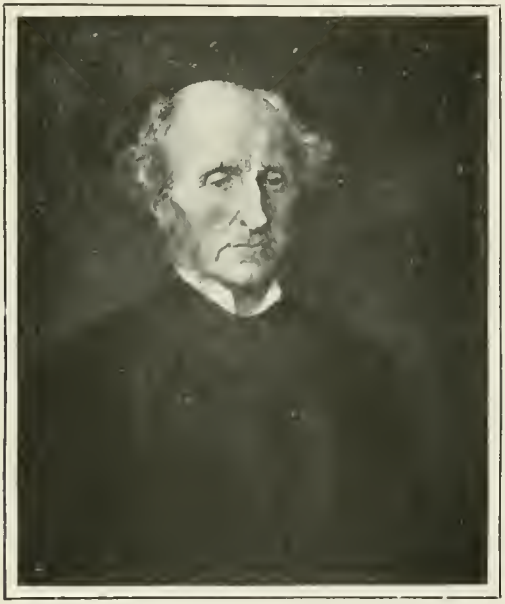
Mill's "System of Logic, Ratiocinative and Inductive: Being a Connected View of the Principles of Evidence and the Methods of Scientific Investigation," appeared in 1843. From about this time may be dated his great influence on English thought. This influence was exercised in many different departments of philosophy: but the department in which, besides logic, Mill left most permanent effect, is political philosophy. The "Logic" and the "Essay on Liberty" were those of his works which he himself expected to last longest. A summary of his general political thinking is to be found in Book VI. of the "Logic" itself. Here, with the aid of principles derived from Comte, he makes a distinct advance on the political doctrine of his father, to which we must now return.

**Mill's Political Philosophy.**

In one fundamental point he follows his father's method. Both alike hold that politics, in the most general sense, is an "art." As such it has a practical end. From a knowledge of the relations between social causes and effects, we have to discover the means of attaining the end. This is the proper place of theory. We are not to provide ourselves at starting with universal precepts, and deduce from these the particular precepts applicable to each case; as is implied in the doctrine of "natural rights." In England, it may be noted, the books having most affinity with this last doctrine are Paine's "Rights of Man" (1791) and Godwin's "Political Justice" (1794). Bentham (Vol. V., p. 563) repudiated it; and it has not in the present century found expression in effective English thought.

The point where J. S. Mill makes his great advance is in the method prescribed for determining those theoretical propositions on which politics as a practical art—so far as it is not purely empirical—depends. James Mill employs what has been called by his son the "geometrical" method. He lays down certain psychological laws derived from experience of men as individuals,

and from these deduces propositions about the conduct of men collectively which are held to be true for all political societies. These theoretical propositions being established, and the public good, defined in the utilitarian sense, being laid down as the end, it is then possible, he holds, to deduce the conditions of good government. According to J. S. Mill, this method is too



JOHN STUART MILL, BY G. F. WATTS, R.A.
(*National Portrait Gallery; by permission of Mr. F. Hollyer.*)

"abstract." Even in Political Economy, which only informs us of certain "tendencies" that would be completely realised if men were moved by one class of motives and by no others, we have to employ a more complex kind of method than this "geometrical" procedure, viz. the "physical" or "concrete deductive" method, which takes account of varying conditions. And the science of society as a whole is too complex to admit of treatment even by this method. Here we have to use the "inverse deductive" or "historical" method. This consists in a double process by which empirical generalisations are first made inductively from the facts of history and then verified by

deduction from known laws of human nature. It is derived from Comte, who had already put it forward as fundamental for his new science of "Sociology."

The doctrine of natural rights had been formulated with a practical aim in the American Declaration of Independence (1776) and the French Declaration of the Rights of Man (1789). James Mill's political doctrine had an important part in preparing for the Reform Bill (1832). If there was to be good government, it was necessary, according to James Mill and the "philosophical Radicals," that the interests of the rulers should be identical with those of the ruled. The only possible means of securing this was a wide extension of the suffrage, together with complete responsibility of representatives to constituents. J. S. Mill, taking it for granted that this aim, if it had not been completely attained, would be attained sooner or later, went on to consider the means of preventing the democratic system, when fully established, from lapsing into a tyranny of the majority. In the essays on "Liberty" (1859) and on "Representative Government" (1861) the distinctive practical aim put forward is to secure, whether by constitutional safeguards or by the education of opinion, a sphere of personal freedom marked off from the sphere within which political or social regulation is necessarily supreme. At the outset no "abstract right" of the individual to freedom of thought or speech is affirmed; the argument is, in accordance with Mill's general principles, that complete intellectual liberty, and even a certain toleration on the part of society for new "experiments in living," is to the ultimate benefit of society and the State. The "Essay on Liberty" has taken its place in English literature as a classical expression of this doctrine.

Mill's Ethics and Metaphysics.

The most important of Mill's remaining philosophical works are the "Utilitarianism" (first published in *Fraser's Magazine*, 1861) and the "Examination of Sir William Hamilton's Philosophy" (1865). This last work, apart from the "Logic," contains Mill's principal contributions to psychology and metaphysics. In it he maintains, in opposition to Hamilton's realistic theory of the external world, an idealism like that of Berkeley. Against the position that there are principles of knowledge not derived from experience he upholds his father's view that principles apparently irreducible can be explained by

'inseparable association." This he applies both to "necessary truths," such as those of mathematics, and to belief in an external world independent of consciousness. The "Utilitarianism" sets forth an ethical doctrine considerably modified from Bentham's to meet opposing views. This doctrine, however, is not now precisely representative of any philosophic school. The whole state of the controversy has been transformed by later ideas.

HENRY LONGUEVILLE MANSEL, BY WILLIAM RIVIERE.
*(By permission of Mrs. Mansel.)*

Mansel.

The "Examination of Hamilton" called forth a reply from Dean Mansel in "The Philosophy of the Conditioned" (1866). Henry Longueville Mansel (1820–71) was Hamilton's ablest disciple, and made important contributions to the revival of the Aristotelian logic. He maintains Hamilton's view that logic is purely and simply the science of formal thinking. His logical positions are developed in notes to a republication of Aldrich's "Artis Logicae Rudimenta" (1849) and in "Prolegomena Logica: An Inquiry into the Psychological Character of Logical Processes" (1851). In his Bampton Lectures on "The Limits of Religious Thought" (1858) he applies Hamilton's demarcation

of the spheres of the Conditioned and the Unconditioned to theology. The Conditioned is the sphere of knowledge: the Unconditioned, of faith. As we have no positive conceptions which are applicable to the Unconditioned, we must here accept without criticism the assertions of Christian theology. For revelation is established by external testimony; and all rational criticism is incompetent where positive conception fails. This position, as implying that moral attributes are to be ascribed to an entirely unknowable Deity, Mill attacks in a celebrated passage of the "Hamilton." A summary of Mansel's philosophy is contained in the article "Metaphysics" contributed to the eighth edition of the "Encyclopædia Britannica" and separately published in 1860.

**Formal Logic.**

The revival of logical studies in part took a direction which did not much influence, and was not influenced by, Mill's inductive logic. Attempts were made to give new development to logic on its formal side. The earliest of these was by George Bentham, well known as a systematic botanist. In 1827 he published an "Outline of a New System of Logic," in which is stated the discovery known as the "quantification of the predicate." The same discovery was afterwards put forth by Sir William Hamilton and by De Morgan, between whom at first arose a contest about priority. De Morgan's chief logical treatise, "Formal Logic, or the Calculus of Inference, Necessary and Probable," appeared in 1847. In it is stated his theory of the "numerically definite syllogism." Another eminent mathematician, George Boole, made still more important contributions to what has since been known as "symbolic logic." His theory is developed in "An Investigation of the Laws of Thought, on which are founded the Mathematical Theories of Logic and Probabilities" (1854). The mathematical development depends on the principle of the quantified predicate. The sign of quantity ("all" or "some") being attached to the predicate as well as to the subject, we get propositions such as "All equilateral triangles are all equiangular triangles." (This the ordinary logic regards as made up of the two propositions, "All equilateral triangles are equiangular" and "All equiangular triangles are equilateral.") The point for "symbolic logic" is that propositions of the new form can be treated as equations; and that logical processes can then be facilitated by the use of symbols.

**Boole.**

Working on Boole's system, William Stanley Jevons[1] (1835–82) arrived at a more convenient symbolic method in his works "Pure Logic" (1864), "The Substitution of Similars" (1869), and "The Principles of Science" (1874). The last two of these belong chronologically to our next period, but are mentioned here because they are so closely associated with the preceding logical movement. In "The Principles of Science" Jevons does not deal merely with formal inferences, but goes over the ground traversed by Mill in his inductive logic. Competent critics are of opinion that he displays more knowledge of actual scientific methods of investigation than Mill, but less philosophic insight. Jevons.

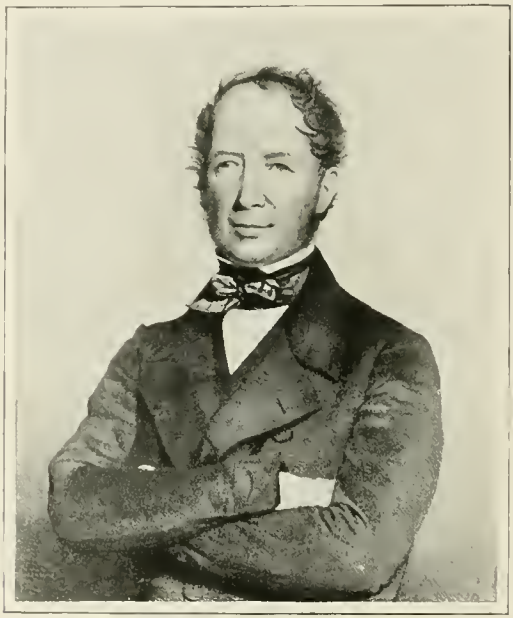
Among philosophers who cannot be brought definitely within any school are Samuel Bailey (1791–1870) and James Frederick Ferrier (1808–64). Bailey, while he is an associationist and a utilitarian, is a realist as regards the external world; holding that perception of objects is an act not capable of resolution into anything else. His realism led him to oppose Berkeley's theory of vision, of which J. S. Mill undertook the defence against him. Ferrier proceeds from the Scottish school, but is an idealist in the manner of Berkeley. In the "Institutes of Metaphysics" (1854) he attempts a strict demonstration of idealism after the geometrical method of Spinoza. Bailey and Ferrier.

Near the end of our period comes the unfinished Introduction to the "History of Civilisation in England," planned out on an immense scale by Henry Thomas Buckle (1821–62). Of this Introduction the first volume appeared in 1857, the second in 1861. It is admittedly the result of a unique range of reading, and displays brilliant generalising powers. The question that has exercised critics is whether the generalisations are of a really scientific kind. Whether accepted or not, many of them have become familiar in current thought, and have had a decidedly stimulating effect. Buckle.

During the nineteenth century biology fully kept pace with the other sciences in the process of specialisation. In particular, much advance was made in botany. The earlier years were occupied with the introduction of the "natural system" variously modified, and the displacement by it of the "artificial THOMAS WHITTAKER. Biology.

[1] Best remembered, perhaps, as a political economist.]

system" of Linnæus. The services of Robert Brown in this respect were referred to in Volume V., p. 754. John Lindley (1799–1865), Sir William Jackson Hooker (1785–1865), and George Bentham, a nephew of Jeremy Bentham, carried forward the movement. Lindley's "Introduction to the Natural System of Botany" appeared in 1830. Sir William Hooker, like Lindley, was the author of an extensive series of works on systematic



JOHN LINDLEY, AFTER J. H. MAGUIRE.
(*By permission of the Royal Horticultural Society.*)

botany. Several of them deal with mosses and ferns and other cryptogamic plants. In the investigations of cryptogamic botany great progress has been made. This class of investigations is of peculiar importance as a comparative study; for the forms of plants described collectively as "cryptogamic" are extremely various in type, and display a number of transitional structures by which intervals of organisation that at first seemed impassable are bridged over. This is of interest in relation to the doctrine of evolution, the establishment of which is the advance in biological generalisation by which the century is distinguished.

1865]

In connection with the name of Sir William Hooker, his foundation of the herbarium at Kew must be referred to. In 1840 he took charge of the Botanical Gardens there. The preparation for his special work was made by botanical

INTERIOR OF THE GREAT PALM HOUSE, KEW GARDENS.

expeditions to Iceland and on the Continent of Europe. His work in geographical botany, as well as the direction of the Botanical Gardens, has been continued by his son, Sir Joseph Dalton Hooker, whose "New Zealand Flora" appeared in 1853.

Sex in Plants.

Although botany has reached so high a stage of specialisation, it is only within the present century that such a fundamental point as the distinction of sexes in plants has been completely

recognised. This distinction had indeed been noted in various cases from a very early period; and the facts had long been beyond doubt for scientific investigators. Yet in the earlier years of the period we are speaking of writers who denied them could still get serious attention. They have since then been far more elaborately investigated. The embryology of plants, in particular, has been carried some stages further. Of late the subject has entered upon a new phase through its relation to the investigations of Darwin, which must be the principal topic of the present section.

**Zoology.**

As in botany, so in the other special departments of biology, most names even of the more important writers must be omitted. In zoology, the work of comparative anatomy has been promoted especially by Sir Richard Owen ("Classification of the Mammalia," 1859) and Thomas Henry Huxley ("Man's Place in Nature," 1863). On questions of general theory these eminent investigators took quite different lines. Towards the great biological revolution of the century Owen appeared mainly as an opponent, while Huxley was its most zealous apostle.

**The Theory of Evolution.**

The establishment of the theory of evolution is not only the greatest biological event of our time; it is also the greatest scientific event. As a general biological theory the doctrine of the descent of species from one another can be traced back considerably beyond the beginning of the present period. From about the middle of the eighteenth century biological thinkers had put forward more or less coherent speculations tending in this direction. The speculations of Erasmus Darwin were mentioned in the preceding volume (V., p. 568). On the same line were those of Lamarck in the "Philosophie Zoologique" (1809). In 1844 appeared anonymously "The Vestiges of the Natural History of Creation," now known to have been written by Robert Chambers. The evolutionary ideas of this work attracted attention; but it was not scientifically well-informed, and had little influence on naturalists. The first effective statement of a scientific hypothesis capable of accounting for biological evolution is due to Alfred Russel Wallace and Charles Darwin. To Darwin's work in applying and testing the hypothesis over the whole field of biology is due its final acceptance.

From the Darwinian theory of the causes of evolution it is necessary to distinguish the doctrine of evolution itself. Though

1865]

the doctrine is older, it is only in our own time that the term evolution has come to be used as the antithesis to creation. Evolution is now equivalent in biology to "transmutation of species," and

THOMAS HENRY HUXLEY.

(*By permission, from the painting by the Hon. J. Collier at the National Portrait Gallery.*)

is opposed to "special creation" of each kind of organism. In philosophy it is opposed to the doctrine that makes an original act of creation the absolute beginning of things. The philosophic doctrine of evolution takes in as particular cases biological

Its Genesis.

evolution and the evolution of the physical universe, as supposed, for example, in the nebular hypothesis of Kant and Laplace. The term evolution in its more and more generalised senses was gradually prepared in the biological controversies of the eighteenth century. In the seventeenth century (Vol. IV., p. 116), Harvey put forward his embryological doctrine of "epigenesis" (1651). According to Harvey's view, the development of the embryo from the germ takes place by the addition of part to part. This was opposed by later observers; and the rival hypothesis was put forward that the parts are all present in miniature from the first, and that the process consists in a gradual unfolding or "evolution" of the germ. This latter hypothesis, accepted in the first half of the eighteenth century, was overthrown by more accurate observations in its second half. Within the first thirty years of the present century it became finally discredited in scientific opinion; and in the newer embryology the theory of epigenesis was restored. The term evolution, however, remained "as a general name for the history of the steps by which any living being has acquired the morphological and the physiological characters which distinguish it."[1] Evolution in biology, in this generalised sense, may be either that of the individual or of the sum of living beings. In the case of the individual, natural evolution is an undeniable fact. In the case of the sum of living beings, it is now regarded as a fully-established theory. The only controversies still existing on the subject are as to the relative efficacy of the various natural causes that have been assigned.

An additional word may be said on the modern generalisation of the term evolution as the name for a philosophical doctrine, and on the connection of this with the biological theory. The evolutionary philosophy in essence may be traced back to the earliest period of Greek thought. There, "creationist" comes later than "evolutionist" philosophy. Connected with the general view that the world and all its parts are evolved from certain primordial elements or from some different state of things, there were suggestions as to the evolution of life and even the transmutation of species.[2] These speculations

[1] *See* Professor Huxley's article, "Evolution in Biology" ("Science and Culture, and other Essays," 1881).

[2] The earliest recorded speculations upon transmutation of species seem to be those of Anaximander (born about 610 B.C.).

1865]

passed more or less completely into oblivion. The philosophy of medieval Europe was creationist on theological grounds When in modern times forms of life became more accurately known, and were distinguished into species that seem to remain always separate, it was natural to suppose, in accordance with the inherited creationist doctrine, that these were the forms described in the Book of Genesis as having been made in the beginning. The Pentateuchal cosmogony in its obvious meaning was held to be inseparably connected with Christian theology. Scientific men for a long time had nothing positive to urge against it. At length what is called the "scale of beings"—that arrangement of them in order from simple to complex, into which they fall of themselves—began to suggest evolutionary hypotheses. Yet, since no scientifically tenable account of the causes of the supposed transmutation was put forward, naturalists as a body declined to give up the creationist view. A sort of scientific dogma was constituted to the effect that species are immutable, and that each was originally due to a separate act of creation. Those, indeed, who were strictly scientific meant by creation, as they explained, nothing more than the introduction of a new species by an absolutely unknown cause: but for practical purposes the coincidence with the popular theological view was sufficient. Hence when in 1859 the Darwinian theory came forth and was seen to be a genuinely scientific attempt to explain the causes of transmutation, many thought that theology also was involved; and a popular as well as a scientific controversy arose. Biological evolution became what the Copernican astronomy had been long before, a point of attack for theological disputants. The controversy could not be decided without a certain modification—already to some extent compelled by geology—in the views held about the relation between science and the Bible, nor yet without bringing into notice much that had gone before in the way of general evolutionist as opposed to creationist philosophy. In particular it helped to bring forward the evolutionary philosophy which Herbert Spencer had already begun to build up on a basis of modern science. For Spencer, in the "Principles of Psychology" (1855), had definitely adopted biological evolution as the groundwork of his psychological doctrine. With no long delay he incorporated the Darwinian explanation of the causes of evolution in his own

Herbert Spencer

system, and coined a name—"survival of the fittest"—for the Darwinian hypothesis of "natural selection." This name Darwin adopted and sometimes used as an alternative expression. It is time, however, to explain more precisely what the Darwinian hypothesis was, and to give some account of the long course of observation and study by which it had been prepared

**Darwin.** Charles Darwin (1809–82) was born at Shrewsbury. He was the son of Dr. R. W. Darwin, and the grandson of Erasmus Darwin. Of his grandfather's speculations he learnt something at an early period, but, like those of Lamarck, they had no direct influence on his mind. All they did was to give him a certain general familiarity with the notion of a possible transmutation of species. For many years he held to the doctrine of special creation, though only in its strictly scientific sense as introduction of species from time to time by an unknown cause. He was a naturalist before he began to speculate: the taste for natural history being in his case, Darwin thought, certainly innate. At Cambridge, to which university he went with the intention of becoming a clergyman, he came in contact with many distinguished scientific men, and in particular was much stimulated by the influence of J. S. Henslow (died 1861), then Professor of Botany. The foundation of his scientific work, especially that upon species, was laid during his voyage as naturalist on the *Beagle* with Captain Fitz-Roy's expedition (1831–36). On his return he was already fixed in the determination to devote his life to science, the thought of a profession having been insensibly given up. In 1842 he left London with his family, and settled at Downe, in Kent. Henceforth the record of his life, as he himself says, is the publication of his several books.

Darwin published the Journal of his Voyage Round the World in 1839. Here are related the facts which first gave him a definite basis for speculating upon the origin of species. It has been noted that in the MS. Journal (1834) a reference occurs to species as having been created which was suppressed in the published Journal. Darwin's investigations upon species definitely began in 1837; so that they occupied—though not continuously—twenty-one years up to the writing of the "Origin of Species." The facts that first set him thinking seriously upon the subject are mentioned at the beginning of the "Origin."

1865]

"When on board H.M.S. *Beagle* as naturalist," he says, "I was much struck with certain facts in the distribution of the organic beings inhabiting South America, and in the geological relations of the present to the past inhabitants of that continent." There was a similarity of type, he noticed, between distinct species in the continent and in the adjoining islands; and existing species were closely similar to fossil species in the same area. Why

DOWNE HOUSE, DOWNE, KENT.

should this geographical and geological relationship exist if species were not derived from each other? This was the starting-point; but it is remarkable how from the first opening of a note-book on species in 1837 Darwin saw all the bearings of the problem. The case of domesticated animals as capable of throwing light upon it was already present. It seemed clear that as new races of animals are formed by man's selection—this being the more or less conscious selection of certain individuals by breeders—so certain natural races must be "selected" to form new species. The question was, How did such selection become possible? Darwin first saw his way to an answer to this question in 1838, when he read, "for amusement,"

Darwin and Malthus.

Malthus on Population. Malthus (Vol. V., p. 654) shows how population tends to increase at a much quicker rate than the means of subsistence. Since in all races of living beings more are produced than can come to maturity, here is evidently the required material for selection. Darwin now had the clue to the whole subject; but he did not for some time allow himself to speculate in relation to the facts he was collecting. Till 1842 he simply accumulated relevant data, working, as he tells us, on true Baconian principles. He then wrote out a short sketch of his views, which was enlarged and copied in 1844. The mutability of species was approached on the side of variation under domestication. Living forms of all kinds tend to vary slightly from their parents. In the case of domesticated forms, breeders take advantage of these variations to produce new races; selecting those animals for breeding which display most of any characteristic they wish to develop. In the state of Nature, as in the domesticated state, there is variation. Thus there is material for a kind of "selection" here also, since not all that are born can live to maturity and continue the race If the varying forms were destroyed or preserved entirely at random, there would of course be actually no selection though there is material for it. But, as a matter of fact, variations do not all stand an equal chance. Any variations that are better adapted to the conditions tend to be preserved. Under constant external conditions a certain type may remain for a long period without change, because the individuals that vary much from it are likely to be less well adapted, and so have less chance of being preserved than more typical individuals. But, under changing conditions, some new variation is likely to be better adapted. If the conditions continue to change in the same direction, the favourable variation will be preserved, transmitted by heredity, and accumulated. Thus in the state of Nature variations are selected for the advantage of the species; just as, in the domesticated state, breeders select them for their own taste or profit. The "preservation of favoured races in the struggle for existence" may hence be called "natural selection."

Natural Selection.

This general conception had already been arrived at in the sketch of 1844, but it was long before Darwin thought he had worked it out sufficiently to think of publication. In the meantime he did a very extensive piece of detailed species-work.

From 1846 to 1854 he was occupied with a monograph on recent and fossil cirripedes. It is of interest in relation to the general

CHARLES DARWIN.

*(By permission, from the painting by the Hon. John Collier, in the possession of the Linnean Society.)*

problem to note that, in his own species-work, he was struck with "the variability of every part in some slight degree of every species." Professor Huxley regarded the undertaking of

this monograph on cirripedes as a remarkable instance of Darwin's sagacity. Familiarity with the manner in which species are actually constituted enabled him afterwards to avoid "endless errors of detail." Early in 1856 he began to write out his results on a scale three or four times as extensive as that which was afterwards adopted in the "Origin of Species." The work was steadily continued for over two years. In June, 1858, it was interrupted by the arrival of an essay from Alfred Russel Wallace (then in the Malay Archipelago) with the title "On the Tendency of Varieties to depart indefinitely from the Original Type." This turned out to be an anticipation of Darwin's view as to the part taken by natural selection in the origin of species. His first impulse was to publish the essay at once, and to bring out his own book afterwards, thus relinquishing all claim to priority, though he had been so long at work upon the subject. From this course he was dissuaded by Dr. (afterwards Sir J. D.) Hooker and Lyell, to whom his views about species had been submitted from the first. By their advice Mr. Wallace's essay was published in the "Journal of the Linnean Society" (1858) as part of a joint paper by "Messrs. C. Darwin and A. Wallace," of which the full title was "On the Tendency of Species to form Varieties; and on the Perpetuation of Varieties and Species by Natural Means of Selection." Darwin's contribution consisted of (1) extracts from the sketch of 1844; (2) part of a letter to Dr. Asa Gray dated September 5th, 1857. The paper was "communicated" to the Linnean Society by Sir Joseph Hooker and Sir Charles Lyell. Of this course Mr. Wallace fully approved, resigning to Darwin the priority in the more elaborate publication of their theory. After the publication of the "Origin" Darwin writes to Wallace:—

Darwin and Wallace.

> "Before telling you about the progress of opinion on the subject, you must let me say how I admire the generous manner in which you speak of my book. Most persons would in your position have felt some envy or jealousy. How nobly free you seem to be of this common failing of mankind! But you speak far too modestly of yourself. You would, if you had my leisure, have done the work just as well as, perhaps better than, I have done it."

The reading of the joint paper at the Linnean Society called forth no discussion. Not till the publication of the 'Origin of Species" (November 24th, 1859) did the great controversy begin.

The "Origin of Species" itself was meant at first to be

published as a paper or series of papers by the Linnean Society; and even when, as it grew in the writing, this plan was found impracticable, Darwin continued to regard it as an Abstract. It is still spoken of as such in the Introduction to the latest edition. The actual title is "The Origin of Species by means of Natural Selection: or, the Preservation of Favoured Races in the Struggle for Life." On its publication the controversy, scientific and popular, at once began. To Sir J. D. Hooker, Darwin wrote a month before the publication: "I remember thinking, above a year ago, that if ever I lived to see Lyell, yourself, and Huxley come round, partly by my book and partly by their own reflections, I should feel that the subject is safe, and all the world might rail, but that ultimately the theory of Natural Selection (though, no doubt, imperfect in its present condition, and embracing many errors) would prevail." Speaking for scientific inquirers like himself, Professor Huxley says: "That which we were looking for and could not find, till Darwin and Wallace published their views, was a hypothesis respecting the origin of known organic forms, which involved the operation of no causes but such as could be proved to be actually at work. . . . The 'Origin' provided us with the working hypothesis we sought." Lyell (with some reserves) and Hooker were converts as well as Huxley, and all proclaimed their adhesion as occasion or opportunity offered. Among the converts was also Dr. Carpenter, the eminent physiologist. The public advocacy of Huxley was one of the most powerful factors in gradually bringing the world over to "Darwinism."

**The "Origin of Species" and the Darwinian Controversy.**

Opposition to the Darwinian theory on the scientific side came mainly from the older naturalists whose ideas had become fixed. These from the first Darwin expected to be hostile. To Huxley he remarks: "I can pretty plainly see that, if my view is ever to be generally adopted, it will be by young men growing up and replacing the older workers, and these young ones finding that they can group facts and search out lines of investigation better on the notion of descent than on that of creation." Few things, he says to Lyell, had surprised him more than the paucity of objections and difficulties new to him in the published reviews. "One large class of men," he observes in a letter, "more especially I suspect of naturalists, will never care about *any* general question." And in another letter: "The general

**Opponents of Darwin.**

public appreciates a good dose of reasoning, or generalisation, with new and curious remarks on habits, final causes, etc. etc., far more than do the regular naturalists." The hindrance to the spread of the doctrine among the general public that had to be calculated on was the skilful appeal to theological beliefs supposed to be endangered by it. Nor was this entirely absent in scientific circles. Speaking of a possible discussion of the subject at a meeting of scientific men, Darwin says he believes, if it were raised, religion would be brought in by men whom he knew. This occurred in the actual discussions on the book. The theological opposition was stirred up especially by Bishop Wilberforce (then Bishop of Oxford), who, at the meeting of the British Association at Oxford in 1860, made an onslaught on Darwin and Huxley. Huxley was present, and replied in such a manner that the audience, at first hostile, was brought over, at least to the extent of acknowledging that the reply was triumphant. To Professor Owen, who had challenged Huxley on the subject of man's relation to the lower animals, he afterwards replied in the *Natural History Review* (1861). A review of the "Origin," which he got the opportunity of writing in the *Times* (December 26th, 1859), had much effect. In the *Quarterly Review* for July, 1860, there was a hostile review by Bishop Wilberforce. On this Huxley, with characteristic vigour, remarks: "Since Lord Brougham assailed Dr. Young (in the *Edinburgh Review*) the world has seen no such specimen of the insolence of a shallow pretender to a master in science as this remarkable production." The final word on the whole theological opposition has been said by Darwin, referring in a letter to a sermon by Dr. Pusey against evolution (1878)—

"Dr. Pusey's attack will be as powerless to retard by a day the belief in evolution, as were the virulent attacks made by divines fifty years ago against geology, and the still older ones of the Catholic Church against Galileo, for the public is wise enough always to follow scientific men when they agree upon any subject; and now there is almost complete unanimity amongst biologists about evolution, though there is still considerable difference as to the means, such as how far natural selection has acted, and how far external conditions, or whether there exists some mysterious innate tendency to perfectibility."

Upon the question how far external conditions have had a direct part in causing the transmutation of species, Darwin's own opinion fluctuated. So also as to the causes of evolution

assigned by Lamarck, viz. inheritance of the effects of the use and disuse of organs. He never came to hold, as Mr. Wallace does, that practically the sole cause of evolution assignable on biological grounds is natural selection. The "mysterious innate tendency to perfectibility" spoken of above, however, he entirely rejected: exactly as he rejected the tendency he had been at first inclined to assume, for each species to reach a term of its

Environment or Tendency.

*Photo. Walker & Cockerell.*

SIR RICHARD OWEN. BY H. W. PICKERSGILL, R.A.
(*National Portrait Gallery*)

life as the individual does. Species, he came to hold, have neither a natural term of their life nor a natural tendency to improve, but simply an indefinite variability. Thus the fact that species may remain long stationary or may degenerate is no difficulty on the Darwinian, as it is on the Lamarckian, theory of evolution. Darwin himself made this reply against objectors who pointed to facts of a similar kind in the case of human civilisations. As Spencer puts it, "survival of the fittest" is not always survival of the best. Still, on the whole and in the long run, according to both Darwin and Spencer, the successful

forms of organic life and the successful types of civilisation are the best. The theory of natural selection, as more than one eminent biologist has pointed out, restores teleology in a scientific form. The greatest problem that Darwin put before himself from the first was to explain the wonderful adaptations of organisms to their conditions. These were in the most striking cases quite inexplicable by the Lamarckian doctrine; and if they were not explained, it seemed to him that nothing was done. It was natural selection that succeeded in explaining them. There are, indeed, whole groups of facts, apart from those of adaptation, that fit in perfectly with the theory of descent, and are quite unintelligible without it. But the facts of adaptation, before Darwin's hypothesis, resisted all attempts to trace them to natural causes, and their explanation remains still the most conspicuous triumph of the general theory.

Darwin's Later Works.

After the "Origin of Species" Darwin's direct contributions to the theory were: "The Variation of Animals and Plants under Domestication" (1868); "The Descent of Man, and Selection in Relation to Sex" (1871); "The Expression of the Emotions in Man and Animals" (1872). The first of these is principally a collection of facts bearing on variability; but it also contains the hypothesis of "Pangenesis," by which Darwin sought to bring together and explain the facts of heredity. This, in the form he gave it, has not met with general acceptance among biologists. The peculiar favour with which he himself always regarded this "despised child" may perhaps find justification in the use Sir Francis Galton has made of it. By modifying Darwin's assumptions, retaining some and rejecting others, Galton arrived at his conception of the "stirp" (put forward in the Journal of the Anthropological Institute, 1875), which in essential points anticipates the celebrated theory elaborated by Weismann at a later date. The difference is that Galton does not absolutely reject the possibility of what are now called the "Lamarckian" factors in heredity, though he regards them as certainly of minor importance.[1] In the "Descent of Man" Darwin applies the

Galton.

[1] According to the theory of Pangenesis, all the cells of the body, during the process of self-division by which they multiply, throw off "gemmules." By aggregations of these the sexual elements are formed. The gemmules themselves multiply by self-division, and every gemmule admits of being

1865]

general theory of biological evolution to the particular case of the human species. His own opinion was known from an allusion in the "Origin," though he had not gone into the special question. It was, however, clear that if all other living beings were descended from one or a few very simple forms of life, the presumption would be that man himself has his place somewhere in one of the diverging lines of descent. This was now argued out; and in the same volume the theory of sexual selection was put forth. According to this theory, an important influence modifying species is exercised by preferences on the part of the female—*e.g.* in birds, for plumage of particular colours or patterns. The volume on "Expression of the Emotions" takes for its basis the work of Sir C. Bell on "Expression," but rejects his view that certain muscles were formed at first in order to express certain emotions, and seeks instead an explanation in accordance with the principle of natural selection.

The "Descent of Man."

Sexual Selection.

The Darwinian theory has all along found confirmation in its power of explaining details hitherto unexplained and of drawing attention to new facts. The work of the embryologists—among whom may be mentioned F. M. Balfour—has been confirmatory of the doctrine of evolution in general. A confirmation of the doctrine of natural selection is found in the fact of "mimicry"

Verification of the Theory.

developed into a cell. Galton accepts the distinction between body-cells and gemmules, and attributes to the latter the same power of multiplying and of developing into cells; but instead of taking the developed organism he takes the ovum as the starting-point of the theory, and in this way is able completely to transform it. The sum total of germs or gemmules in the newly-fertilised ovum he calls the "stirp." Only the smaller part of this, he supposes, becomes developed into the "personal structure" of the organism. Out of the residue of undeveloped germs or gemmules are formed the sexual elements of the next generation. Thus the notion of a germinal residue "continuous," as Weismann puts it, from one generation to another, is substituted for Darwin's notion of an aggregate newly forming from the body-cells in each new organism. In Weismann's theory hereditary transmission of characters depends wholly, in Galton's it depends mainly, on this undeveloped residue. The process of throwing off gemmules by the cells of the personal structure, which Galton still admits, is held by him to be of minor importance, because it is only needed to account for hereditary transmission of characters acquired through individual experience, and of this he finds hardly any evidence. Weismann, finding no evidence of it, is led to reject wholly the corresponding assumption.

—which occurs, for example, where a species of butterfly which is not specially protected against enemies has the external appearance of a protected species. This subject of "mimicry" was founded by H. W. Bates in "Contributions to an Insect Fauna of the Amazons Valley" (Transactions of the Linnean Society, 1862). And among the most fruitful applications of "Darwinism" are the botanical works of Darwin himself. With a brief reference to them we may conclude the section, thus returning to the subject with which we started.

**Darwin's Botanical Works.**

The remarkable thing in Darwin's botanical works is their peculiarly effective "revival of teleology" from the evolutionary point of view. Of these works the two most important are "The Various Contrivances by which Orchids are fertilised by Insects" (1862) and "The Effects of Cross- and Self-Fertilisation in the Vegetable Kingdom" (1876). The starting-point for these was given by C. K. Sprengel's "Secret of Nature Displayed" (1793), which Darwin had read in 1841 by Robert Brown's advice. Sprengel discovered that in many cases pollen is of necessity carried by insects to the stigma of another *flower*. What Darwin did was to prove experimentally that there is an advantage in the cross-fertilisation of different *plants*, and then to explain contrivances for cross-fertilisation as means of gaining this advantage. The natural cause of this teleological relation between flowers and insects is found in the struggle for existence. Those species of plants that vary in such directions as to evolve contrivances for cross-fertilisation survive by leaving more vigorous and more numerous offspring than results from self-fertilisation. The bearing of this generalisation—which has been summed up in the maxim, "Nature abhors close fertilisation"—on the problem of heredity is obvious; and in recent speculations on the subject it has already begun to display that unlimited suggestiveness which is one of the distinctive marks of Darwin's work.

**D'ARCY POWER. Medicine and Surgery.**

MUCH dissatisfaction had been felt at the attitude which the two great corporate bodies, the Royal College of Physicians and the College of Surgeons, had adopted towards the bulk of the profession in the earlier years of the century. Their position was too conservative and too exclusive to render them fitting

representative bodies. The question was a burning one as early as 1834, when a Select Committee was appointed by Parliament to inquire into and to consider the laws, regulations, and usages regarding the education and practice of the various branches of the medical profession. A voluminous and interesting Report was issued, but it had no practical outcome. A Medical Reform Bill was introduced unsuccessfully in 1840, and again in 1841, but it was not until 1858 that the medical profession of the United Kingdom obtained a statutory constitution. Twenty-one bodies had then the right of granting licences to practice, some in every branch of medicine and surgery, others only in medicine, surgery, or midwifery. The licence sometimes permitted its holder to practice in certain limited parts; sometimes it was universal for the country in which it was issued. It was granted, indeed, after examination in every case, but, as there was no independent control or supervision, it is not a matter of surprise that the examinations varied greatly in severity. At the College of Physicians the Fellowship, which alone conferred full rights within the society, was practically restricted to the graduates of the older Universities. At the College of Surgeons the superior order of Fellows, established in 1843, was open to anyone who had ability to pass the necessary examination.

The Medical Profession

The Medical Act of 1858 materially improved the position of the medical practitioner, but, as it left the individual licensing bodies in possession of their powers, it did not go far in producing order from chaos. The new Act gave a legal definition of the medical profession. It directed the establishment and maintenance of a Medical Register, by which the public and its courts of justice might distinguish "qualified" practitioners of medicine from pretenders and those who were not lawfully qualified. It gave to each registered qualification an equal currency in all parts of the British Empire. It created a superintending Council for the purposes of the Act, and it empowered this Council to strike off the Register the names of persons who should be convicted of crime or whose professional conduct it should consider infamous. It authorised the Council to impeach before the Privy Council any licensing body who should grant its diploma on insufficient conditions of study, or after an improper examination. It failed, however, to provide for

a complete examination, and it was amended by the Medical Acts of 1870 and 1886, though its chief clauses still hold good.

The most remarkable event in the period under consideration was the discovery and introduction into practice of general

SIR JAMES YOUNG SIMPSON.

(*From the statue in Prince's Street, Edinburgh.*)

Anæsthetics.

anæsthesia. The local use of chloric ether to deaden pain had been known to dentists for some time before 1844, but until that year general anæsthesia had never been induced for any surgical purpose. On December 11th, 1844, Horace Wells, a dentist in Massachusetts, inhaled nitrous oxide whilst another dentist extracted an aching tooth. His successful result proved the starting-point of a long series of experiments, in which another dentist, William Thomas Green Morton, took a leading part. He rendered himself insensible by inhaling sulphuric ether on September 30th, 1846, and from that date the use of

1865]

ether as an anæsthetic was established. The blessing spread rapidly from the Massachusetts General Hospital to all parts of the world, but on Nov. 10th, 1847, Dr. (afterwards Sir James Y.) Simpson, Professor of Midwifery in the University of Edinburgh, directed the attention of the Edinburgh Medico-Chirurgical

ROBERT LISTON, BY JOHN S. STUMP.
(*By permission of the Royal College of Surgeons, Edinburgh.*)

Society to a new respirable anæsthetic agent—chloroform. He considered that the new drug possessed important advantages over sulphuric ether, inasmuch as a smaller quantity was required to produce insensibility; because its action was more rapid, whilst its inhalation was more agreeable; and, above all, because no elaborate apparatus was required for its administration. He maintained, too, that it was especially adapted for use in his own department of practice. Chloroform was found to fulfil its expectations, and it speedily came into general use.

Surgery.

The introduction and extensive employment of anæsthesia caused the first great advance which had been made in surgery for many years, an advance for which the way had already been paved by that minute attention to the study of anatomy which

had characterised the earlier years of the century. The surgical art culminated in Robert Liston, a surgeon more rapid, dexterous, and brilliant than the world had ever seen. The fate of the brilliant operator was sealed by the advent of anæsthetics, and his place was taken by his more careful brother, who too often errs upon the side of slowness and is tediously minute in his attention to detail. The advantage, however, is all upon the side of the patient. Conservative surgery is the rule throughout the profession, yet operations are much more numerous than they were formerly, since the surgeon performs more intricate ones, and the patient gives his consent more readily as he no longer dreads the pain.

**Medicine.** The general practice of medicine was improving, but at a somewhat slower rate than surgery. Bleeding was the first of the old practices to disappear. It vanished suddenly and almost too completely. Nauseous mixtures given in large doses, abundant purgation, and counter-irritation still held sway. They were shortly to be displaced by a more elegant pharmacy rendered possible by improved chemical methods, and by more exact diagnosis obtained by a more thorough knowledge of morbid anatomy, and by the use of such instruments of precision as the ophthalmoscope, the laryngoscope, the otoscope, and the various forms of specula. The microscope became more and more serviceable to the working practitioner, whilst the clinical thermometer, which had been used by Dr. James Currie, of Liverpool, in 1797, was reintroduced by Dr. John Davy in 1844, though it did not come into general use in connection with disease until after the publication of Wunderlich's book in 1868.

**Public Health.** The most remarkable fact in connection with the public health of the country is the reappearance of diphtheria. It commenced as a world-wide epidemic which lasted from 1858–63, and it remained a very fatal endemic disease until lately, when the antitoxin treatment has given us means to combat it with some hope of a successful issue. The cattle plague of the Russian steppes was again epidemic in England in 1865 (p. 488), though it was more than a hundred years since its ravages had been felt in this country. Very great advances were made in State medicine. The total abolition of burial in 1852 within urban limits was a movement of the first impor-

tance, whilst the application of the Darwinian theory has yielded results of unlooked-for importance when it has been employed in connection with epidemiology. In 1862-63 the distress in the cotton-weaving districts of England led to a recurrence of the famine disease with which the older practitioners had been only too familiar, whilst Asiatic cholera again showed itself in 1865.

The Army Medical Service has undergone a complete change during the present century. A soldier who was wounded in the Low Countries or in the American War either remained where he fell until the battle was over, or he was helped to the rear by some of his comrades, who were sometimes more anxious to save their own skins than to help the injured man. The numerous engagements of the Peninsular War led to a greater attention being paid to the sick. The bandsmen of the regiment were first detailed as bearers, and they conveyed the wounded from the fighting line until they could be attended by the regimental surgeon. They were supplied with stretchers, and when no skilled assistance was immediately available they were ordered to carry their wounded patient until he could be placed in such empty carts or waggons as might be available to convey him back to the hospital. The bandsmen made but inefficient bearers, for they received no regular instruction in this part of their duty, whilst the commissariat waggons and the bullock-carts were wholly unsuited for the conveyance of men who had been badly wounded. The Army Medical Service.

Veterinary-Surgeon Cherry was one of the first to suggest an improvement upon this state of affairs when he advocated in 1825 the use of a special spring-cart for the conveyance of the sick and wounded during active service. It was not until the Crimean War that any real attempt was made to cope with the difficulty in a rational and humane manner. The early attempts were very bungling. The Army Hospital Corps was formed in 1854, and was provided with proper carts; but the attendants were military pensioners, who were physically incapable of performing the duties of bearers, and were too often found to be wholly unfit in other respects for the responsibilities imposed upon them. The Hospital Corps was soon disbanded, and for a time a certain proportion of soldiers was taken from the ranks to act as bearers and hospital orderlies. A fresh

departure was made in June, 1856, when the Medical Staff Corps was established, but the corps was disbanded in the following year for want of a proper military organisation. Its place in the service was then taken by the Army Hospital Corps, whose ranks were filled by soldiers who volunteered for duty after they had served a certain length of time with the colours. This corps continued, with various minor changes, until 1873, when a royal warrant placed all the medical officers in a single department, and abolished, with a few exceptions, the regimental system which had hitherto been a distinguishing feature of the English Army. The name of this department was altered in 1884 from the Army Hospital Corps to the Royal Army Medical Corps, and it consists of two parts. The corps is composed of non-commissioned officers and men serving in the military hospitals during peace, and with additional duties as stretcher-bearers in time of war. It is commanded by the commissioned medical officers known collectively as the Army Medical Staff. The Medical Staff Corps is a stationary body, with its headquarters at Netley, officered by the Army Medical Staff, which is constantly shifting. Officers as well as men, however, are trained in their duties by a special drill to qualify them for conducting the transport of the wounded both in the open and in mountain warfare.

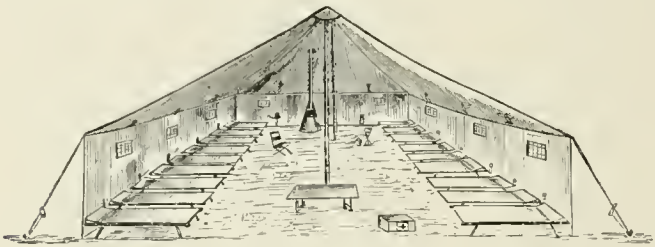
The responsibility for the immediate treatment of the wounded upon the field of battle is divided. The wounded man may be first assisted by his comrades, for two men in each company are specially trained to render first aid to the injured. He is carried to "the collecting station," which is as near the fighting line as possible, either by these men or by the bearers of the Medical Staff Corps, acting under the orders of a surgeon-captain or a surgeon-lieutenant. The "collecting station" is in charge of a sergeant of the Royal Army Medical Corps, whose duty it is to see that the wounded men on their stretchers are carefully placed in the waggons here ready to convey them back to the "dressing station." This is a building or tent, near a good supply of water, and as close as is convenient to the "collecting station." It is under the control of a surgeon-major, and it completes the "first line of assistance." Minor and urgent capital operations are performed at the "dressing station," but it is so near the line of fire that an advance or retreat may become

*Photo: F. G. O. Stuart, Southampton.*

NETLEY HOSPITAL.

necessary at any moment. The wounded are conveyed by a second set of waggons from the "dressing station" to the "field hospital," beyond the line of fire and constituting the first link in the "second line of assistance." From the "field hospital" the wounded may be transferred to the "station hospital," and may thence be transported further and further to the rear until he reaches at last the "base hospital," which receives the chronic cases.

Such is the theory of the treatment of those wounded in battle. It appears to be effective in small wars, where the number of those injured is not great, but fortunately we have



AMBULANCE TENT.

(*From the "Manual of Ambulance Transport," by Sir T. Longmore and W. A. Morris, by permission of the Controller of His Majesty's Stationery Office.*)

not as yet had any opportunity of ascertaining whether so complicated a system will be of service after a great battle. It had often been tested in small wars, where the number of those injured was not great; and the war of 1899–1902 in South Africa proved that it was efficient in a long campaign, where it was sometimes necessary to treat large numbers of wounded men.

W. LAIRD CLOWES. The Mercantile Marine.

For many years after the general introduction of steamships for ocean passenger traffic, and for packet service, they were comparatively little used for the ordinary purposes of distant trade, the greatly increased cost of working them not being compensated for by the relatively slight saving of time in those days of low-pressure boilers and moderate speeds. But as engines and boilers began to improve, speeds to rise, and passages to diminish largely in duration, it became evident that the position of the merchant sailing-ship as a freight-carrier for all save the

cheapest and least perishable commodities, was being seriously threatened. It was plain, too, that comparatively slow vessels of the old steady-going bluff-built East Indiaman type had no longer a chance in the competition. The consciousness of this caused a remarkable advance in the art of sailing-ship construction; first in the United States, and then, when the commercial marine of the great American Republic had been crushed by the consequences of the Civil War, in Great Britain. Some progress, indeed, was made in England and Scotland ere the American Civil War had well begun; and it was much facilitated by the introduction of the system of composite construction—an iron frame with wooden planking for ships' hulls. But it was not until after the war that the final rivalry between canvas and steam reached what may be called the historic stage. It would be scarcely fair to say that canvas was beaten on its merits; for it is a remarkable fact that until the Suez Canal was opened the quickest passages between China and England were performed by sailing vessels. The piercing of the isthmus, however, decided the contest in favour of the steam, and neutralised the splendid qualities of the marvellous clippers which, during the four or five years ending with 1872, when the hopelessness of the struggle became recognised, fought so gallantly with their fate.

**The Clipper Ships.**

Among the most celebrated of these clippers were the *Cutty Sark*, the *Thermopylæ*, and the *Sir Lancelot*; and among the designers and builders who gained distinction in connection with them and similar craft were Messrs. Robert Steel & Co., of Greenock; Messrs. Walter Hood & Co., of Aberdeen; Mr. William Pile, of Sunderland; Mr. B. Waymouth, later Secretary of Lloyd's Register; and Captains Maxton, Rodger, and Bullock. All the ships were engaged in the China tea trade; and the rivalry which produced such extraordinary results had its direct origin in the anxiety of English merchants to receive each year the first portion of the tea crop at the earliest possible moment. There were thus annual races home, the prize to be won being very substantial owing to the craving demands of the London market. The most noteworthy of these races took place a year or two before the completion of the craft above mentioned, and consequently before the very highest triumphs of sail-power had been attained; but a word concerning it must be said, if only to

**The Tea Races.**

illustrate how close was the competition. It was in 1866, and five vessels, the *Taeping*, *Ariel*, *Serica*, *Fiery Cross*, and *Taitsing*, ran. The three first-named sailed from Foo-chow-foo on the same day, and, though they lost sight of one another during the voyage, arrived in the Thames with only a period of a few hours between the first and the last.

Fast Sailing.

The *Cutty Sark* never did such extremely fast sailing as was sometimes accomplished by the *Thermopylæ* and the *Sir Lancelot*; but she gained great distinction in 1870–72 by her plucky contests with both those famous ships. On the last occasion, in spite of the fact that she lost her rudder, she ran home from Shanghai as quickly as the redoubtable *Sir Lancelot* did from Foo-chow-foo, the time in each case being 122 days. But, compared with the record-passage of each of her opponents, this was a slow voyage. The *Thermopylæ* (p. 749) was a composite clipper of 947 tons register, measuring 210 feet long by 36 feet beam, and having 21 feet depth of hold. She was designed by Mr. Waymouth, and built in 1868 by Messrs. Hood for Messrs. George Thompson, junr., & Co. In 1868 she ran from London to Melbourne in 60 days; but her most brilliant performances were in 1869 and 1870. In the former year she left Foo-chow-foo on July 3rd, and arrived in England on October 2nd, having made the passage in 91 days. On one day in the latter year she covered 330 nautical miles, a distance equal to nearly 16 statute miles an hour. This was almost the best speed of the finest ocean steamers of those days; yet, magnificent though it was, it was exceeded by the record of the *Sir Lancelot*, which was indeed "the fastest clipper that ever cleft a wave." The *Sir Lancelot*, also a composite craft, was built by Steel of Greenock for Mr. James McCunn, and was of 886 tons register, measuring 197 feet 6 inches long, by 33 feet 7 inches broad, and having a depth in hold of 21 feet. When fully laden with 300 tons of various ballast and 1,430 tons of tea, she drew 18 feet 7 inches of water forward, and 2 inches more aft. Her complement was 30 all told, and when in racing trim she spread no less than 45,500 superficial feet, or considerably more than one acre, of canvas. In 1869 she ran from Foo-chow-foo to the West India Docks in just under 90 days, and made, as her best run in twenty-four hours, the unparalleled distance of 354 miles. On December 5th, 1890, the

great Cunard steamer *Servia*, of 10000 horse-power, being then on a homeward passage from New York, covered exactly the same distance; but the average distance run by the *Servia* on each complete day of that particular passage was only 342 miles. The comparison is sufficient to establish the altogether marvellous performances of the sailing clippers. Long ere the *Sir Lancelot* had made her reputation, the British clippers had hopelessly beaten the American clippers which in the previous

THE CLIPPERS *ARIEL* AND *TIFFING* RACING OFF THE LIZARD.
(*By permission, from the "Illustrated London News,"* 1866.)

generation had been the "flyers of the seas"; and in the 'sixties and early 'seventies it was quite a common thing for British clippers to be engaged to convey early tea to New York. The splendour of the results attained failed to prevent the most valuable sea-borne commerce of the world from passing from canvas to steam; but the efforts were not wasted. The lessons learnt through the clippers were utilised in the improvement of yacht building.

Steam-ships.

The first passenger steamer[1] of any kind was probably the *Clermont*, which was launched at New York in 1807, and which for some time afterwards ran regularly on the Hudson. The next

[1] Some of the information in subsequent pages has been kindly supplied by the Secretaries of the P. & O. and R.M.S. Companies, and by Messrs. Grindlay & Co.

The Atlantic Service.

was the *Comet*, launched upon the Clyde in 1812 (V., p. 815). But these vessels were not sea-going ships. In 1818, however, a Mr. Scarlborough, of Savannah, Georgia, purchased a vessel which was on the stocks there, fitted her with engines and paddles, named her *Savannah*, and in 1819 crossed in her to Liverpool, occupying 32 days on the voyage. This craft, owing to the relatively small amount of fuel carried, could not steam the whole distance, and was for eleven or twelve days under sail; and it was not until 1838 that any ship crossed from port to port under steam alone. In that year two vessels performed the feat, and both were British. One was the *Sirius*, belonging to the British and American Steam Navigation Company: the other was the *Great Western*, belonging to the Great Western Steam Navigation Company. The *Sirius*, 178 feet long by 25 feet 6 inches broad, was of 703 tons, and 320 nominal horse power. She left Cork on April 4th, 1838, and, after encountering severe weather, arrived inside Sandy Hook on April 22nd, and anchored on the following day in the North River. The *Great Western*, 236 feet long by 35 feet 6 inches broad, was of 1,340 tons, and 750 nominal horse-power. She left Bristol on April 8th, and entered New York on April 23rd. The best day's run of the *Sirius* was 220 miles; that of the *Great Western* 247 miles. The average speed of the former was 7 knots; that of the latter 8·2 knots an hour. On her first homeward voyage, the *Great Western* carried sixty-eight cabin passengers at 35 guineas apiece, and 20,000 letters. When she left New York she had on board 570 tons of coal; when she reached Bristol, 178 tons remained. This was very soon after Dr. Dionysius Lardner had been so rash as to declare: "As well might they attempt a voyage to the moon, as to run regularly between England and New York." At once new vessels for the Transatlantic trade were built. The owners of the *Sirius* produced the *British Queen* and the *President*; the owners of the *Great Western* eventually produced the first Atlantic iron screw steamer, the *Great Britain* (p. 466): while another company, the Transatlantic, ran the *Royal William* and the *Liverpool*. The Transatlantic Line was the first to run from Liverpool, and was the pioneer of the enormous New York traffic which now steams in and out of the Mersey. Such were the small beginnings. In 1838, as has been seen, the record steaming time between

England and New York was about 15 days. The successive improvements effected by the introduction of the screw, the invention first of compound and then of triple expansion high-pressure engines, the corresponding progress in boiler construction, the substitution of iron for wood, and of steel for iron as the material of the hulls of vessels, and the general increase in size of ships and power of engines, reduced the record for 1885 to less than seven days. Nor was this the only measure of the progress made during the period. In 1838, even

THE *GREAT WESTERN*.
(*By permission of Messrs. Henry Castle & Sons.*)

the best kind of ocean travelling was excessively disagreeable, especially to persons of delicate health and to women; and a very few days after leaving port the supplies of fresh food became exhausted. But long before 1885 there had been a complete revolution in this respect through the employment of artificial refrigeration and cold storage; so that the traveller, although he might suffer from motion and confinement, was deprived of few or none of the material comforts of a first-rate hotel on shore.

**Size of Steamships.**

The dimensions of some of the earlier ocean steamships have been glanced at. There was soon a great increase in size; and as far back as 1858, when the *Great Eastern* was launched at Millwall, after designs by I. K. Brunel (p. 280), the limit of magnitude attained in the nineteenth century, though by no

means of power and speed, was reached. This colossal vessel was 679 feet 6 inches long, by 82 feet 8 inches broad, and had a depth of 48 feet 2 inches, and a draught when loaded of 28 feet. Her net tonnage was 13,344, and her loaded displacement was estimated at 23,000 tons. Built of iron, she was driven by screw as well as paddles, and was rigged as a six-masted barque. She made several voyages to America at great loss to her owners, but was found so useful in the laying of the Atlantic cable of 1866 that for a time she earned money as a cable ship. The experiment was, however, too costly to be repeated; and the biggest ocean steamer running in 1885 was the *City of Rome*, which measured only 560 feet 2 inches long by 52 feet 3 inches broad, with a depth in hold of 37 feet. Close behind her in point of size came the sister ships *Etruria* and *Umbria*, of the Cunard line. But in 1885, size again betrayed a tendency to grow; and although the lengths to which it went in 1858 were not repeated till 1903, even the *City of Rome*, with her 8,453 gross tonnage, and her 11,153 indicated horse-power, is almost insignificant in comparison with the later monsters, like the *Campania* and *Lucania*, of nearly 13,000 gross tonnage, and 30,000 indicated horse-power, or the second *Oceanic*.

The Great Lines.

Among the numerous great passenger and mail-carrying steamship lines which sprang into existence consequent upon the supersession of sail-power as the principal means of locomotion at sea, are the following:—

| Name of Company. | Date of Establishment or Incorporation. | Trading to |
|---|---|---|
| Royal Mail Steam Packet Co. | 1839 | West Indies, S. America, Pacific. |
| Peninsular and Oriental Co. | 1840 | India, the Far East, Australia. |
| Cunard Steamship Co. | 1840 | United States, Mediterranean. |
| Pacific Steam Navigation Co. | 1840 | S. America, etc. |
| Inman Steamship Co. | 1850 | United States. |
| J. and A. Allan Brothers | 1852 | Canada, United States. |
| African Steamship Co. | 1852 | Africa. |
| Union Steamship Co. | 1853 | S. Africa. |
| British India Steam Navigation Co. | 1855 | India and the Far East. |
| Anchor Line | 1856 | N. America, Mediterranean, India. |
| Guion Line | 1866 | United States. |
| British and African Steam Navigation Co. | 1868 | West Africa. |
| White Star Line | 1870 | United States, etc. |
| Dominion Line | 1872 | Canada, United States. |
| Castle Line | 1872 | S. Africa. |
| Orient Line | 1877 | Mediterranean, Ceylon, Australia. |
| Natal Line | 1879 | S. Africa, India. |
| The Shaw, Savill, and Albion Co. | 1884 | Australasia. |

THE *GREAT EASTERN* OFF THE ISLE OF WIGHT.
(*From a painting in the Victoria and Albert Museum.*)

There are many others—such, for example, as the New Zealand Shipping Company, the Clan Line, the Bibby Line, the City Line, etc. etc.—but, for the purpose of illustrating the gradual growth of the modern British mercantile marine, which has had so enormous an influence on the consolidation of the empire, and the extension of British commerce, it will suffice to note a few facts in the histories of some of the older companies mentioned in the above table.

**The Royal Mail Co.**

The Royal Mail Steam Packet Company, though chartered in 1839, did not begin active work until 1842. Its first

THE *CAMPANIA*.

steamers, fourteen in number, were 240 feet long and of 1,300 tons, and 400 nominal horse-power—with a speed of little more than eight knots. In 1885 it owned about 80,000 tons of shipping.

**The P. & O.**

The Peninsular and Oriental Company was incorporated by Royal Charter in 1840, but the Peninsular Company, which was the parent concern, was started in 1837, while the steamers which the Company took over had been running for some years previously as far as Lisbon only—the first of them, the *William Fawcett*, of 206 tons and 60 horse-power nominal—as early as 1829. The new Company quickly succeeded in establishing a postal service from Falmouth to Vigo, Oporto, Lisbon, Cadiz, and Gibraltar. This was the beginning of its extensive mail services *viâ* Egypt, namely, to India, China, Japan, and Australia.

The *Hindostan*, in 1842, was the first steamer despatched by the Company *viâ* the Cape, for the purpose of running between Suez and Calcutta, and in less than three years afterwards the chain of mail communication with India and China was completed, Australia being also brought within the sphere of the Company's operations in 1851.[1]

In the earlier days the Overland Route through Egypt, which determined the operations of the Company, was a very primitive

MODEL OF THE *WILLIAM FAWCETT*.
*(By permission of the Peninsular and Oriental Steam Navigation Company.)*

affair. It had been pioneered by Lieut. T. Waghorn, R.N., but had never been of any real value until the P. & O. Company, by their enterprise, settled the question of sea conveyance. After landing at Alexandria,[2] the first part of the transit was by the Mahmoudieh Canal, the great work of Mehemet Ali, for connecting Alexandria with the Nile, by means of which the produce of the Delta was diverted to that port from Rosetta, the former emporium of trade. This journey of 48 miles was accomplished in a big mastless canal boat, in form not unlike the dahabeahs

[1] The Australian Mail Service was interrupted by the Crimean War, and subsequently passed for a time into the hands of the Eastern and Australian, and of the Royal Mail Company, but was resumed by the P. & O. in 1859.

Abridged from the *P. & O. Pocket Book*, published by the Company.

used for ascending the Nile, which was towed by a steam-tug at the modest rate of five miles an hour. From Atfeh, where the Canal debouches from the Nile, steamers started for Cairo, a distance of 120 miles, and accomplished the trip in about sixteen hours. Passengers had then to remain the night in Cairo, and sometimes even two or three days. Those who may have travelled from Suez across the Isthmus in summer will recall with vivid gratitude their plunge into the big stone baths in the lower region of Shepherd's Hotel. From Cairo the route lay across the desert for ninety miles, and the journey was performed in two-wheeled omnibuses holding six persons, drawn by four mules or horses, the road being merely a cutting in the sand, which in the night time was not distinguishable from the desert itself. Indeed it was a very frequent occurrence for the horses to stray into the desert when the driver supposed he was in the middle of the road, the mistake being only discovered when the beasts were floundering in a bank of sand, from which they were often not extricated until other horses had been brought to the rescue from the nearest station, four or five miles away. The transport of cargo by these primitive methods was almost more difficult than that of passengers, more especially between Cairo and Suez, where every package had to be carried on a camel's back. Many thousands of these animals were employed in connection with this work, which embraced not only the transport of mails and cargo, but also of water from the Nile for the several desert stations, and for Suez. It is a curious fact that it was cheaper to send even steamer coal from Alexandria across the desert in this way than to send it round the Cape by sailing vessel to Suez. Indeed, not more than half a dozen vessels found their way up the Red Sea with coal during the whole time when the Company required to take fuel on board there. It is needless, therefore, to say that the directors of the P. & O. Company were the first to urge upon the Pasha of Egypt the necessity of constructing a railway across the Isthmus. The final accomplishment of this task in 1859 changed the character of the Egyptian transit to that with which the public became familiar in later times. The services of the Company, however, have for many years been carried on by the Suez Canal.

The progress of the Company has been one of steady development, and it continues in point of the value of its tonnage to

THE *RIPON* LEAVING SOUTHAMPTON WITH TROOPS FOR THE CRIMEA

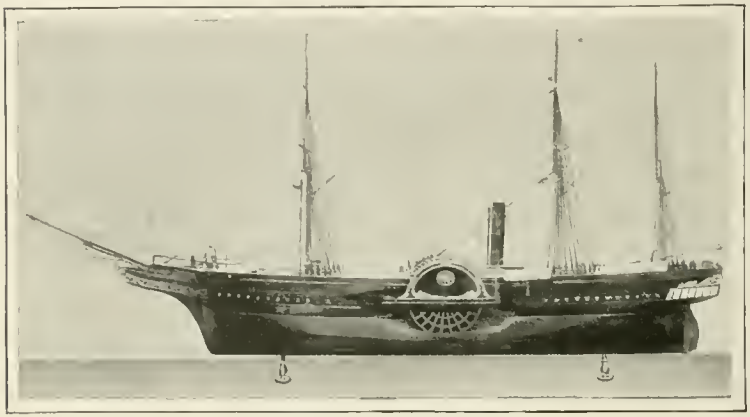
*(From a painting, by permission of the Peninsular and Oriental Steam Navigation Company.)*

be at the head of maritime enterprise in this country. The report for 1903 showed a tonnage of 351,433 tons and 361,658 horse power, acquired at a cost of nearly £10,000,000.

The Cunard Line originated in consequence of the determination of the British Government to send its American mails by steamers instead of by sailing vessels. When tenders for this purpose were invited, Mr. Samuel Cunard, a merchant of Halifax, Nova Scotia, came to England, and succeeded in persuading Mr. G. Burns and Mr. D. McIver that there was a good opportunity for establishing a magnificent business. The three gentlemen tendered successfully, secured a subsidy of £80,000 a year, and at once built four paddle steamships, the first of which, the *Britannia*, left Liverpool for Boston on July 4th, 1840, and made her port in 14½ days. The dimensions and general particulars of these first ships of the great line were:—Length, 207 ft.; breadth, 34 ft. 2 in.; depth, 22 ft. 4 in.; tonnage, 2,050; nominal horse-power, 740. For some years the Cunard Company enjoyed almost a monopoly of the best-paying portion of the Atlantic trade, but presently American competition arose. A number of merchants in New York, Philadelphia, and Boston combined, and, having obtained a Government subsidy, started the Collins Line, with the avowed intention of "running the Cunarders off the Atlantic." The four vessels of the new company averaged on their passages from America 9 days 17 hours, and to America 11 days 10 hours 26 minutes, while the average of the Cunarders was nearly a day and a half longer; but extravagance, mismanagement, and misfortune soon ruined the American company, and once more the Cunard Line became supreme, although rivalry on a smaller scale was never altogether lacking, until the coming of the inevitable time when great English rivals arose and forced the pioneers of the Atlantic traffic to divide with them the profits of the trade. The Cunard has always, and deservedly, held the reputation of being a fortunate line. It is true that it lost the *Columbia* in 1843, and the *Tripoli* in 1872; and that the *Oregon*, the finest and fastest of its fleet existing in 1885, was mysteriously sunk by collision in the course of the following year; but up to the end of the period under review the company was able, apparently with literal truth, to boast that it had never been responsible for the loss of the life of a single one of

its millions of passengers. The company adopted the screw for its finest ships in 1863, transferred its preference from wooden to iron vessels about 1864, and began to substitute steel for iron about 1881.[1]

The credit of having originated the Pacific Steam Navigation Company is due to an American, Mr. William Wheelwright, sometime United States consul at Panama. He obtained certain privileges and concessions on the Pacific coast of South America, and then, coming to England, formed a company,



MODEL OF THE *BRITANNIA*.
(*By permission of the Cunard Steamship Company.*)

which was given a charter of incorporation in 1840. The company began with two small steamers, the *Chili* and the *Peru*, of but 700 tons register, and, after overcoming considerable difficulties, succeeded in gradually monopolising most of the best trade on the Pacific coast of South America. It deserves to be recorded in its favour that it was the first of the ocean-going lines to adopt compound engines. It took this step as early as 1856, and, for many years after that date, was almost singular in its faith in the new form of machinery.

The first great English rival of the Cunard was the Inman

[1] In 1903 it entered into close relations with the Government, undertaking to build, with its assistance, two new steamships of a higher speed than had been attained up to that date, and arranging to place its whole fleet in case of need at the disposal of the State.

Company, which was founded in 1850 by the amalgamation of two firms, one seated in Philadelphia and New York, and the other in Liverpool, under the style of the Liverpool, New York, and Philadelphia Steamship Company. During the Crimean War some of the original partners sold out, because they did not approve of their vessels being let to the Government for war purposes: and then the company took the name of a partner who had a less nice conscience, Mr. Inman. The company first attained celebrity by undertaking the conveyance of emigrants,

THE *CITY OF LONDON*.

(*By permission, from Henry Fry: "The History of North Atlantic Steam Navigation."* Sampson Low, Marston & Co.)

who had previously been carried by sailing vessels exclusively. By reducing fares it quickly destroyed the sailing-packet business, and prepared the way for the enormous emigrant traffic westwards which was one of the most striking phenomena of the third quarter of the century. But it made its way in the face of immense difficulties and numerous misfortunes. One of its first vessels, the *City of Glasgow*, sailed in 1854, and was never again heard of. In the same year another of its ships, the *City of Philadelphia*, ran ashore. In 1864 it lost the *City of New York*. In 1870 another of its liners, the *City of Boston*, disappeared mysteriously with all on board. And still later, it lost the *City of Washington* in 1873, and the *City of Brussels* in 1883. Subsequently to 1885 it was reorganised as an American company.

The Allan Line may be called the lineal descendant of a Canadian line of sailing ships dating from 1820. It established a steamer service in 1852: this developed into a mail service between Quebec and Liverpool in 1856; and, later, services between Halifax and Liverpool, and from Glasgow and Liverpool to Quebec, Boston, etc., were started and successfully worked.

The African Steamship Company, the earliest of the great African lines, may be said to have had its origin in the private expedition of Mr. Macgregor Laird, of Liverpool, in 1832, for the exploration of the Niger. A regular mail and passenger service to the West African coast was not, however, established until 1852, when the company was chartered. The first vessel launched for the purpose was the *Forerunner*, measuring 161 feet 5 inches in length, and of only 381 tons builders' measurement and 50 nominal horse-power. After 1885 the company amalgamated with the Liverpool firm of Elder, Dempster and Co., and greatly enlarged its sphere of action.

The Union Steamship Line began business as a steam collier company; but in 1857 it secured a contract to carry the Cape mails, and altered the character of its fleet.[1]

The British India Steam Navigation Company sprang into existence to meet a desire on the part of the East India Company for the establishment of a mail service between Calcutta and Burmah. In 1862 it received its present name. In 1885 it was the largest of the companies trading to the East, possessing as it did about 100 steamers, with an aggregate tonnage of 265,000; and in 1881 the British India Association, in conjunction with it, established a service from London to Java and Queensland.

The Anchor Line is a development of one of the old sailing-ship companies; and its first steamer, the *Tempest*, was, in fact, a converted vessel. Originally trading elsewhere as well, and still running to the Mediterranean and India, the company's energies have latterly been particularly directed to the cultivation of its Atlantic business.

The Galway Line, an Irish enterprise, was started in 1859, and began to run under its mail contract in June, 1860. By starting from Galway and calling at St. John's, N.F., the promoters hoped to reduce the time for telegrams between

[1 It has been amalgamated with the Castle Line since January 1, 1900.]

Europe and America to six days—there being then no Atlantic cable. A Government subsidy was secured of £5,000 per round voyage, and four large steamers were built; but the promoters were quite unable to fulfil their contract, and the project was abandoned in 1861. Its history had been one continuous record of disaster, nautical and financial alike.

The Guion Line began its operations with the *Manhattan* and the *Chicago*, but distinguished itself beyond its competitors by putting on the Atlantic the *Arizona* in 1879 and the *Alaska* in 1881. These vessels successively held the record for the passage between Queenstown and Sandy Hook. The *Arizona's* best times were—7 days 8 hours eastwards, and 7 days 8 hours 49 minutes westwards. The *Alaska's* best time, 6 days 18 hours 37 minutes on the homeward trip, gained for her the title of "the greyhound of the Atlantic." Travellers owe a debt of gratitude to the owners of these vessels, who initiated a great acceleration of speed, and in some measure obliged other companies to enter upon a course which several of them were very unwilling to take until they saw their profits threatening to pass from them to their more progressive rivals.

The White Star Line, owned chiefly by Messrs. Ismay, Imrie and Co., of Liverpool, began to run in 1872. The steamships, the first of which was the *Oceanic*, were designed and built by Harland and Wolff, of Belfast; they were all of a uniform and novel type, longer and with less beam relatively than any vessel then running. Their saloon accommodation was placed amidships, the engines being aft of it—the chief of many improvements for the comfort of the passengers which this line was the first to introduce; they had compound engines, which effected a considerable economy in coal. The new line sprang at once into a leading position, though its popularity was soon seriously affected for a time by the terrible wreck of the *Atlantic* on the Nova Scotia coast on April 1st, 1873, when 560 lives were lost. The *Britannic* and *Germanic*, added to the White Star fleet in 1874, lowered the record between Queenstown to Sandy Hook to less than eight days. The same owners afterwards established lines of steamships of a similar type between San Francisco, Japan and China, and also between London and New Zealand, the latter in conjunction with the Shaw, Savill, and Albion Company; and in 1889 and 1890 respectively the

*Teutonic* and *Majestic* were added to the Atlantic service. Subsequently to 1885, Messrs. Harland and Wolff also designed and built for them cargo steamers of a greatly improved type, each of which could carry 6,000 tons of freight (and some much more), besides about 1,000 live cattle, across the Atlantic at little less than the speed of the *Persia* in 1856, and on a far smaller consumption of coal. The first of these, the *Cufic*, was launched in 1888.[1]

Until the general introduction of the compound engine

THE FIRST *OCEANIC*, 1871.
(*By permission of Messrs. Ismay, Imrie & Co., Liverpool.*)

(p. 460) long voyages under steam were as a rule commercially unprofitable. Until the opening of the Suez Canal the passenger trade with Australia and (to a less extent) with India was largely carried on by sailing vessels; while, until the Inman and other Atlantic lines found it profitable to lower steerage fares, the Atlantic emigrant traffic was similarly conducted. The clipper ships of the Black Ball, White Star, and Aberdeen lines to Australia, the liners of Messrs. Money Wigram and Sons, and Messrs. Green's famous line of East Indiamen (some of which also ran to Australia), can here receive only a passing mention.

[1] The launch of the second *Oceanic*, of the *Celtic*, both exceeding the *Great Eastern* in some of their dimensions, and of other huge steamers, including a whole fleet for the Australian service, and the transfer of the line to American owners, though not to the American flag, belong to the twentieth century. The tonnage of the *Great Eastern* was first exceeded by the *Baltic*, launched in 1903.

*Photo: Priestley & Sons, Egremont.*

THE *ALASKA*.

But steam was to some extent employed on these long voyages; a monthly line of auxiliary screw steamers, the *Golden Fleece*, *Indiana*, and others, ran from London to India *via* the Cape and Mauritius in 1862–4, and steam-power was used as an auxiliary to sail-power in several Australian liners long before steamships finally displaced the old clippers. The *Royal Charter* and the *London* are probably the best remembered of these "auxiliary steamships," having been wrecked with great loss of life in 1859 and 1866 respectively. The *Great Britain*, too, ended her active career in the direct Australian service. Subsequently, mail steamships ran for some years between Panama, Auckland, and Sydney, in connection with the Royal Mail Company, and after the opening of the Pacific Railway a service was established between San Francisco and Australasian ports (1873), followed by a service from British Columbia to Australia in connection with the Canadian Pacific (1893). It was not until the establishment of the Orient Line, which at first took the Cape route, that direct and regular steam communication without transhipment was established with Australia, other than that provided by the P. and O. service.

A few words must be said, in conclusion, on the progress in lighting and buoying the British seas since the installation of the first sea lighthouses and lightships (Vol. V., p. 28). In the Middle Ages lights for the guidance of seafarers had been regularly exhibited as an act of piety by monks, hermits, or priests, as at St. Catherine's Point, in the Isle of Wight, and from the chapel on St. Alban's Head, the church towers of Blakeney in Norfolk, Boston in Lincolnshire, and elsewhere, but most of these were probably discontinued at the Reformation. Subsequently a few lighthouses were established under Royal patents, and maintained out of dues levied for the profit of the patentees, on vessels entering adjacent ports. Many of these were bought up by Trinity House (Vol. III., p. 157) during the latter part of the eighteenth century, and the last five, together with several which belonged to the Crown but had been leased to contractors, were vested in that Corporation by statute in 1836.[1] The Scottish and Irish lights are under boards established towards the end of the eighteenth century, all three authorities being subjected by the

[1] 6 & 7 William IV., cap. 79. The five were the Skerries (Vol. V., p. 29). Longships, Smalls, Spurn, and Tynemouth Castle.

statute in question to the control of the Board of Trade. Light dues are still regarded as tolls chargeable on the ships which profit by the lighthouses, and so retain a trace of their origin.

During the nineteenth century, particularly its latter half, immense progress was made. A host of lighthouses proved that modern engineering could build successfully alike on storm-swept rocks or on shifting sands. Of the first class are the lighthouses on the Bell Rock (1808–1811); Skerryvore, off Tiree (1836–1844); Bishop Rock (probably the most exposed lighthouse in the world, built 1852–1858 raised and strengthened in 1883–

MODEL OF THE *GREAT BRITAIN*.
(*Victoria and Albert Museum.*)

1887); the Wolf Rock, near Scilly (1862–1869), and the existing Eddystone, the fourth built eastward of Smeaton's in 1878–1882 partly because the foundation of the third lighthouse was being undermined. Of the second class the Maplin may serve as an example. The medieval coal fires survived in some few cases as illuminants till nearly the second quarter of the nineteenth century, and candles in some places till the third. Now, oil burners and complicated reflectors have been devised, the electric light has come into use, though not extensively mechanism has provided an additional means of identifying lighthouses by the number and length of flashes they emit, and the invention of oil gas and acetylene has made it possible to place on buoys or beacons lights which need only

occasional attention. In addition, elaborate horns and steam sirens are replacing the bells, gongs, and guns formerly used to warn ships during fog, and wireless telegraphy (1904) is beginning to link the distant sea lighthouses and lightships with the shore. At the beginning of the nineteenth century there were hardly more than thirty lights off the British coast. In 1884, excluding harbour lights, there were nearly 200 lighthouses, and about sixty lightships.

W. E. BEAR, The Vicissitudes of Agriculture.

THE year 1846 was a notable one in the annals of British agriculture. The alarm of landowners and farmers at the Act for the repeal of the corn laws (p. 166) was extreme, and the ruin of British agriculture was confidently predicted. The spirits of the cultivators of the soil were further discouraged by a bad harvest and by a devastating visitation of potato disease, which was first known in this country in the preceding year. So great was the destruction of the crop that it produced the great Irish Famine of 1846–47 (p. 338). The deficiency of the corn harvest and the increased demand for flour due to the destruction of the potato crop, however, caused wheat to rise in price from 54s. 8d. a quarter[1] in 1846 to 69s. 9d. in 1847: while barley advanced from 32s. 8d. to 44s. 2d., and oats from 23s. 8d. to 28s. 8d. These advances were obtained in spite of a considerable increase of imports. In 1845 the total receipts of wheat, including flour in wheat equivalents, amounted to 1,141,957 quarters; in 1846 the quantity was 2,344,142 quarters; and in 1847 it rose to 4,464,757 quarters. All other kinds of grain and meal amounted to 1,287,959 quarters in the year preceding the repeal of the corn laws, to 2,408,032 quarters in that year, and to 7,449,107 quarters in 1847. Apparently these imports were in excess of the national requirements, for they were reduced about 45 per cent. in 1848, although there was another deficient harvest in that year; and yet the prices of corn fell to 50s. 6d. per quarter for wheat, 31s. 6d. for barley, and 20s. 6d. for oats. But it was not until 1849 that prices declined to the extent which had been expected as the result of Free Trade, and then commenced a period of depression which caused agriculturists

[1] These prices are averages for each year. In the week ending May 31, 1847, the average was as high as 102s., but speedily declined.

The Wolf Rock Lighthouse.

A Modern Lightship.

The Maplin Lighthouse.

EXAMPLES OF MODERN LIGHTHOUSES AND LIGHTSHIP

*(By permission of the Elder Brethren, Trinity House.)*

to fear that their most gloomy predictions were about to be realised.

Owing in great measure to the collapse of the mad railway speculation in 1847 (pp. 311, 489), a serious commercial crisis occurred in that year, and trade was in a prostrate condition for nearly five years longer. The prices of corn, it has been shown, kept up fairly until 1849, in which year wheat fell to an average of 44s. 3d. per quarter, barley to 27s. 9d., and oats to 17s. 6d. There was a further fall in 1850, and for wheat the minimum of 38s. 6d. was reached in 1851, by which time a recovery had set in for barley and oats. The annual average price of wheat had not been so low before during the century, and that of barley had only once before been so low, while oats had not once been as cheap as they were in 1850. Such prices were regarded as ruinous by the farmers of those days, and there was a great outcry for the re-imposition of the corn duties on the one hand and for a reduction of rents on the other. In consequence of the general depression of trade in the country, meat and dairy produce, as well as corn, fell in value. But the rates had been greatly diminished by the operation of the new Poor Law, and the tithe rent-charge had fallen a little, though, owing to the seven years' average system, not nearly in proportion with the fall in the prices of corn. A few of the great landlords granted remissions of rent; but hardly any allowed permanent reductions, and in many counties where labourers' wages were only 7s., or even 6s. a week in some cases, farmers were threatening a reduction.

According to Mr. (afterwards Sir James) Caird, the wages of agricultural labourers in England in 1846, immediately before the repeal of the corn laws, averaged 9s. 6d. a week. In 1851 he made the average the same, the range being from 7s. in a few of the southern, eastern and western counties to 13s. 6d. in Lancashire. There were extras for piecework and in harvest, and payments in kind, such as beer, fuel, and, in some cases, a cottage rent free, these allowances, as a rule, being greatest where wages were lowest. Therefore the sums named were not the total earnings in all cases, though some of the day labourers possibly lost nearly as much through short time as they gained from extras. In many counties there was a redundancy of labour, and wages were kept down by the bad system pursued by

the farmers of dividing the surplus men among themselves to keep them off the rates. This occurred in the southern half of England; and it is a curious fact that whereas Arthur Young, in 1770, estimated the average wages in the northern counties visited by him at 6s. 9d. a week, and those of the southern counties at 7s. 6d., Caird made the averages, in 1851, 11s. 6d. for the north and only 8s. 5d. for the south. The change had been wrought, of course, by the great progress made in the manufacturing and mining districts of the north. The Law of Settlement was held mainly responsible for retaining surplus labourers in one part of England while their services were needed in another, men in South Wilts receiving 6s. a week, while their fellows in one part of Lancashire were getting 15s. But some approach to the same disparity was to be found long after the Union Chargeability Act (1865) was passed, and is even to be noticed still. Miserably as the labourers were paid in the south of England, they were probably better off than they had been in the days of Protection, as it was estimated that the cost of provisions generally had fallen 30 per cent. between 1840 and 1850. A stone of flour, which cost 2s. 6d. in the earlier year, could be bought for 1s. 8d. in the later, while tea and sugar had fallen about 50 per cent.

For the purpose of investigating the extent and causes of the distress in the agricultural interest, Mr. James Caird, at the beginning of 1850, was employed by the *Times* to visit the principal counties of England, following the footsteps of Arthur Young after an interval of eighty years. Mr. Caird spent about thirteen months in his investigation, visiting thirty-two of the English counties, and gathering a large amount of interesting information, which was published in a volume entitled "English Agriculture in 1850–51," after it had appeared in the journal for which it was collected. With many indications of the agricultural improvement which had taken place since Young's time, the traveller found also much in confirmation of a statement made by Sir Robert Peel in a letter which is included in the preface to his volume. After remarking that Mr. Caird would find immense tracts of good land in certain counties, with good roads, good markets, and a moist climate, pretty nearly in a state of nature, undrained, badly fenced, and wretchedly farmed, Sir Robert said:—

"Nothing has hitherto been effectual in awakening the proprietors to a sense of their own interests. I cannot help thinking that a dispassionate and temperate contrast between the productiveness of their properties and that of others in less favoured positions, and the conclusive proof that might be exhibited that Protection had in their cases not stimulated improvement, but had probably been the parent of neglect, might reconcile them to the withdrawal of it, and induce them to look out for more certain aid in 'good farming under liberal covenants.'"

There is abundant evidence in the book to prove that in spite of the great improvements carried out by the best landowners and farmers in the several counties, the great majority had been rendered apathetic by the high prices which Protection for many years had secured to them.[1] Comparing Young's statistics with his own, Mr. Caird estimated that, in the eighty years ending with 1850, the average rent of land had risen 100 per cent., the average produce of wheat per acre 15 per cent., labourers' wages 34 per cent., cottage rent 100 per cent., the price of butter 100 per cent., that of meat 70 per cent., and that of wool upwards of 100 per cent. The price of wheat, after its great fall, was about the same in 1850 (40s. 3d.) as in 1770. Allowing for the fact that the smaller area of wheat grown in 1770 was produced on a higher average quality of land than the extended area of 1850, as the best soils were devoted to wheat, Mr. Caird points out that an increase of 15 per cent. in yield per acre (from 23 to 26½ bushels), although indicative of higher farming, was insignificant in relation to the enormous increase of rent. On the other hand, he thought that, as larger and earlier maturing cattle and sheep of better size and quality were kept on the land than at the earlier date, the production of meat, wool, and dairy produce had kept pace with the advance of rent. As matters turned out, it is fortunate that Mr. Caird was more concerned with the changes in agricultural circumstances which had occurred since Young's time than with the more immediate purpose of his tour—the cause of the agricultural depression prevailing at the time. From this point of view his work was defective, as he had hardly anything to say about the changes in agricultural circumstances caused by the loss of

[1] As the author says in his concluding remarks, "During a period of high prices moderate rents could be paid without the investment of much capital by the tenant; but low prices and universal competition compel agricultural improvement." Up to a certain limit this is true, and a fall in prices sufficient to render enterprise hopeless had not occurred when Caird's book was written.

Protection. As the depression proved only temporary, Caird's work is all the more valuable for its treatment of the agricultural condition of the country on broader lines than were apparently contemplated when he was sent upon his travels; but still it is to be

OUTLINE MAP ILLUSTRATING ENGLISH AGRICULTURE IN 1850.
(*James Caird, "English Agriculture, 1850-51."*)

regretted that he made no systematic attempt to compare rents, rates, wages, and the prices of farm products in 1850 with those of the period immediately preceding the repeal of the corn laws, or, say, with those of 1840.

It is not surprising to find in the evidence of depression collected by Mr. Caird in 1850 some of the signs with which the crisis of our own times has made us familiar. In some counties farms were thrown on the landlords' hands. For example, the

Duke of Marlborough had over 5,000, acres in hand. the former tenants having been unable to pay the rents, which had been raised about ten years before. The Duke refused to make any abatement, and many of his farms, after being impoverished, were deserted. The country around Blenheim at the time presented a poverty-stricken appearance. As in the depression after 1879, it was the occupiers of heavy clay soils who suffered most severely in 1850; while those who held good light land suitable for green crops and the maintenance of a large number of live stock had less to complain of, and farmers of good pasture were able to hold their own. In the fertile Vale of Aylesbury dairy farming was declared to be the only branch of agriculture which paid at the prices ruling at the time. Butter, in January, was selling at 1s. 2d. a pound. The price at that period of the year had been 1s. 3d. to 1s. 4d. from 1839 to 1847, and 1s. 6d. in 1848. Still, at the reduced price, butter paid, whereas fat cattle were not selling well, and a poor crop of wheat, at the reduced price, was regarded as utterly unremunerative. In some parts of the country the plan of saving expenses adopted so commonly since 1879, that of laying land down to pasture, was carried into effect. Farmers were advised to grow more feeding crops and less corn, as foreign competition in meat and dairy produce was not serious, while corn was coming into the country in increasing quantities. It is true that the imports of dairy produce were even then considerable, 330,579 cwts. of butter and 347,803 cwts. of cheese having been received from foreign sources in 1850; but these quantities were readily absorbed. Meat was not in any form among the principal articles imported.

The Revival.

But the depression was not to last long. The gold discoveries in California in 1848 and in Australia in 1850–51 had begun to tell by 1852, and a rise of prices, with a great development of trade, set in before the beginning of 1853. In that year wheat averaged 53s. 3d. a quarter, barley 33s. 2d., and oats 21s., and the troubles of corn-growers were at an end. This, indeed, was the beginning of one of the most prosperous periods ever enjoyed by corn-growers. The Russian War began in 1854, and the average prices of corn were 72s. 5d. a quarter for wheat, 36s. for barley, and 27s. 11d. for oats. In the following year there was an advance of 2s. 3d. in wheat, and although barley gave way slightly, it rose

above 41s. in 1856, and above 42s. in 1857, the averages for wheat being 69s. 2d. and 56s. 4d. Many farmers made fortunes, and rents went up with a run. In 1858 and 1859 there was a reaction in trade and agriculture alike, following the commercial crisis of 1857, the year of the Indian Mutiny: but 1860 ushered in a period of high corn prices three years in duration.

Ten Years of Prosperity.

Taking all things into consideration, the period of ten years ending with 1862 was probably the most prosperous decade ever enjoyed by British agriculturists. The prices of all kinds of corn together were higher than they had been in any ten years since 1833, and for barley and oats the averages were higher than in the decade ending with that year. The values of meat and dairy produce advanced, and were highly satisfactory during the latter part of the period; while rates were much lower than they were up to 1833. The harvests, too, except in 1853 and 1860, were good or fair. Until the bad harvest of 1860 occurred, the net imports of wheat, including flour, had only once reached 6,000,000 qrs., and had usually been under 5,000,000 qrs. It was probably the great harvest of 1857, when we grew over 17,000,000 qrs. of wheat in the United Kingdom, that caused the fall in the price of wheat to 44s. 2d. in 1858, and the production of only a million quarters less in the following year that produced a further decline to 43s. 9d. in 1859. The great importation of over 10,000,000 qrs. in 1860–61 failed to keep the price from rising, and in 1861 the American Civil War began, and the annual average for wheat ranged from 53s. 3d. to 55s. 5d. during the three years 1860–62. During the rest of the period under review, ending with 1865, the prices of corn were comparatively low; but the harvests were the three greatest to occur consecutively of any known in the present half century. Moreover, meat and dairy produce advanced in value, so that agricultural prosperity may be said to have lasted from the end of 1852 until the end of 1865 without interruption. It is true that the imports of grain, flour, cattle, sheep, beef, bacon and hams, butter and cheese, had recently begun to reach alarming dimensions; but, after nearly twenty years of Free Trade, the prices of these products had not been permanently reduced below a remunerative level, and most of them were high during the greater part of the time, while some advanced considerably towards the end of the period.

The progress of agricultural improvement (pp. 292–297) was

Agricultural Progress.

hardly checked during the few years of depression which followed 1847. Indeed, there is reason to believe that landlords and farmers were aroused by the temporary fall in prices to an appreciation of the need of making the most of the resources of the soil. Before 1846, except in some of the eastern and northern counties, draining and other great improvements had been carried out only by the minority of landlords or tenants. As late as 1850, Mr. Caird found scarcely any tile-draining in progress in several of the counties which he visited. In other counties considerable progress in this useful work had been made, however, and the best landlords were offering tiles to their tenants, or carrying out the work themselves, and in most cases charging interest on the outlay, but not in all. Not a few landlords had recourse to the Government Drainage Loans, introduced by Sir Robert Peel in 1848. The loans were repayable, with interest, in twenty-two annual instalments of 6½ per cent. Usually the tenants were required to pay the whole of the instalments, and to cart the tiles as well, so that they really paid for the whole improvement; and cases were known in which they were charged 7½ per cent. on the loans, their landlords thus deriving a profit while getting their estates improved. The use of guano, bones, and superphosphate was becoming common in 1850, though not in all parts of the country, and nitrate of soda was being introduced by a few advanced agriculturists. In Cheshire the use of bones was said to have doubled the produce of the pastures. There are no statistics by which the increased use of some artificial manures can be measured, as the use of coprolites in making superphosphate superseded imported bones to a great extent, besides affecting the consumption of guano. Still the imports of the latter fertiliser increased from 71,414 tons in 1848, after having fallen off for two years, to 237,393 tons in 1865; and those of bones, not sufficient to be separately enumerated in the Statistical Abstract for 1853, had grown to 74,308 tons by 1865. Nitrate of soda, classed with saltpetre in the earlier year, but apparently under 200,000 cwts., increased to over 1,000,000 cwts. in the later one. With respect to farm crops, all now commonly cultivated were grown in 1845; but mangolds greatly increased in acreage during the following twenty years, and the varieties of corn and roots were improved by selection.

Among the most striking of the advances of the period was

the steady improvement of the implements and machinery of the farm. Messrs. Howard and Ransome, to mention only two of the most prominent of many makers, vied with each other in the construction of ploughs for different classes of soil, diminishing the draught and increasing the efficiency of this ancient implement of husbandry. The same firms introduced improved harrows, while Coleman and Crosskill became known

Machinery and Implements.

MODEL OF M'CORMICK'S REAPER.
(*Victoria and Albert Museum.*)

for their cultivators, and the latter for farm carriages of admirable construction, as well as for his famous clod-crusher.[1]

Reaping machines were mentioned as early as the days of Pliny, who describes a Gallic machine which, curiously enough, was of a type now regarded in the United States and some of our colonies as the cheapest of all corn-collectors to work, and known as the "header," as it merely strips the ears off the straw. But although from 1812 onwards numerous attempts were made to construct an effective reaping-machine, and, as early as 1826, the Rev. Patrick Bell brought out one which did good work, it was not until many years later that corn was at all commonly cut by machinery. The Americans were the first to improve upon Bell's

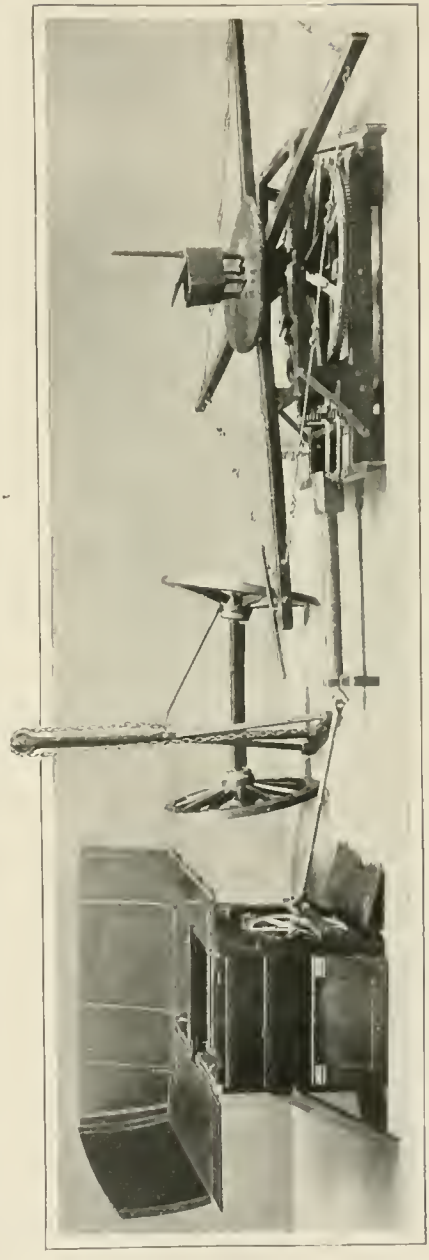
[1] Among the many names that appear in reports of agricultural shows, those of Boby, Garrett, and Hornsby may be noticed as improvers of corn-dressing machines; Smyth and Garrett for drills; Samuelson, Ransome and Bentall for root-cutters and cake-breakers; and Richmond and Chandler, Turner, Picksley, and Bentall among a crowd of manufacturers of chaff-cutters.

machine, though McCormick's adaptation of it, shown here in 1851, was not considered an improvement for use in this country. In 1852 Messrs. Crosskill, of Beverley, acquired the right to make Bell's reaper, and greatly improved it, taking the prize of the Royal Agricultural Society for it in 1853. It was first a two-horse machine, but was widened in 1860, and three horses were then needed to work it, driving it in front of them. It became extensively used, and was the reaper most commonly to be seen at work until after 1872, when Samuelson's one-horse machine came into notice. By 1876 one-horse and two-horse machines by Samuelson, Hornsby, and other makers had superseded the effective but cumbrous Beverley reaper, which left the corn in swaths, while they left it in bundles ready for binding in sheaves.

At the Chester show of the Royal Agricultural Society in 1858 there were over forty threshing-machines, most of them worked by steam, competing for the prizes offered by the society, most of the names of competitors being familiar as those of makers at the present day. The advance in the use of steam threshing-machines must have been very rapid, as it was not at all common in 1850. The successful introduction of steam cultivation was of later date, although it had been attempted many years before. In 1834[1] the Marquis of Tweeddale suggested that a liberal prize should be offered for an effective steam plough. The suggestion was not adopted till 1837, when the society offered a premium of £500 for the successful application of steam power to the cultivation of the soil. In the same year an invention by Mr. John Heathcoat, M.P., was tried, and found to succeed in moss soil, but not on ordinary land. This steam plough came to an untimely end, as it disappeared in the night following a trial, having sunk in the moss. The society's premium was repeated until 1843, when it was withdrawn. In 1851 and 1852 a premium of £200 was offered, but not won, although a rotary cultivator patented by Mr. John Usher, of Edinburgh, did such good work that it came near the winning point. It was renewed in 1857, when Mr. John Fowler, jun., of London, was the only maker to enter for trial. His plough, drawn by a single engine, with an anchor, was awarded the prize. In the meantime several other steam

[1] Ramsay, "History of the Highland and Agricultural Society of Scotland," p. 433.

ploughs or cultivators had been patented, but only three came to the test of a competition at Chester in 1858, when the Royal Agricultural Society offered a prize of £500, which was won by Fowler. In 1856, Smith's cultivator had been tried successfully at Chelmsford, in connection with the Royal Show, in the presence of crowds of spectators, and from that year Mr. Smith worked his own land by steam up to the end of his occupancy of his Woolston farm. He may therefore be regarded as the pioneer of successful steam cultivation, although he was beaten by Fowler's single-engine system in 1858; and the same maker's double-engine system, with balance plough or cultivator, came most of all into use later on. In 1859, Mr. J. A. Clark, in the Royal Agricultural Society's Journal, gave a list of thirty-eight landowners and farmers in the United Kingdom who were using Smith's steam cultivator, and another list of thirty-five persons who were either using or about to use Fowler's steam plough. Further improvements took place before the great trials of 1864 at Newcastle were



PORTABLE HORSE-POWER THRASHING MACHINE.
(*Victoria and Albert Museum. By permission of Messrs. Garrett & Sons.*)

held, when some new makers were in the field, and the work done by several of the competitors was highly satisfactory.[1]

Farmers' Clubs.

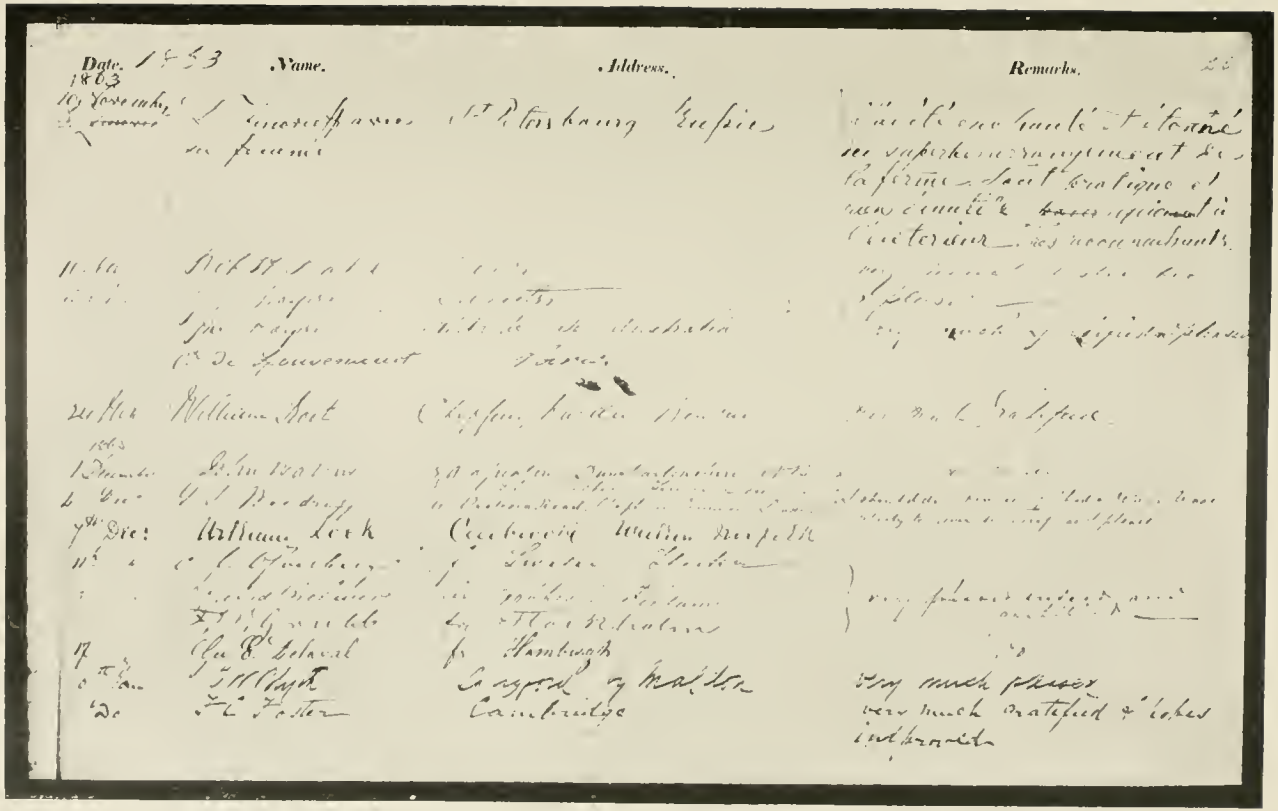
In these times many agricultural societies were organised, and began to hold annual shows of live stock and implements. The farmers' clubs, too, were in the height of their prosperity, and their discussions of points in farming excited a great deal of interest. There was more hope in the profitableness of new methods than there has been in later times. Old-fashioned farmers, who still formed the majority of their class, derided the "new lights" and the "book farmers," but were often induced, by little and little, to follow the lead of those whom they affected to despise as teachers. One of the most beneficent of associations, the Royal Agricultural Benevolent Institution, was founded in 1860.

J. J. MECHI.
(*From his "How to Farm Profitably,"* 1864.)

During the prosperous period for trade and agriculture alike, many men who had made money in commerce were attracted by their love of country life and their faith in the possibilities of scientific agriculture to rent land, and their competition for farms had a considerable effect in raising rents. Mr. J. J. Mechi was the most notable of the "apron-string farmers." He purchased Tiptree Hall Farm in 1841, and spent a great portion of the fortune he had gained in commerce in improving his property. He was an enthusiastic advocate of the application of science and the

"Apron-string" Farmers.

[1] Landowners and farmers who were conspicuous as agricultural improvers were so numerous that it seems almost invidious to select names for special mention. Among them in England were Mr. Philip Pusey, Mr. J. J. Mechi, the Earl of Leicester, Sir Robert Peel, the Duke of Portland, the Duke of Bedford, Mr. John Walter, Mr. Hudson, Mr. Fisher Hobbs, Mr. Hutley, Mr. James Webb, Mr. H. Overman, Mr. Chaplin, the Earl of Yarborough, the Duke of Newcastle, the Earl of Derby, the Duke of Wellington, Lord Sefton, Sir James Graham, Earl Grey, Lord Vernon, Earl Spencer, Sir John Conroy, Mr. Paget, Mr. Torr, Mr. Huxtable, Mr. Beasley, Mr. Wells, Mr. Outhwaite, Mr. Morton, Mr. Thomas, and Mr. Williams of Baydon, who was a notable pioneer in steam cultivation.




PAGE OF THE VISITORS' BOOK, TIPTREE HALL.
(*MS. Add.* 30,015.)

latest mechanical inventions to agriculture, and equally eager in denouncing slovenly methods of farming. During his long career he did much good, although he made not a few mistakes in the application of theory to practice. He was denounced by many farmers for raising rents by showing landlords what could be made of land by judicious improvement, and his annual balance-sheets were keenly criticised. But his hearty geniality made friends of those who came in contact with him, and there was widespread regret when misfortunes not connected with his farming almost ruined him; while the esteem of those who knew him was heightened by his honourable assumption of liabilities for which he was not wholly responsible.

**Larger Farms.**

The consolidation of farms was one of the features of the prosperous times which followed the depression of 1849–51. As men of little capital were constrained to quit their holdings, their land in many cases was acquired by prosperous neighbours, and thousands of farmhouses were converted into dwellings for bailiffs or labourers, the land being farmed off-hand. In some instances small farms were purchased by farmers, and for a time the steady decrease in the yeomanry was checked, but not for long.

**Stock-Breeding.**

During the period under notice the improvement of live stock received a great impetus by the multiplication of agricultural shows, and by the fashion of breeding pedigree animals, which grew up among landlords and other wealthy men. In the breeding of Shorthorn cattle especially, what was called the "pedigree mania" came into great prominence, and fancy prices were realised for animals of particular tribes, quite beyond their intrinsic value. Some harm was done by the rage for pedigree as distinct from merit; but, on the whole, the "mania" did good by attracting an immense amount of capital to the industry, and by spreading offshoots from the crack herds all over the country. Great attention, too, was paid to the improvement of horses, sheep, and pigs. Some of the most valued of existing breeds of sheep became widely known during the period, although founded by the crossing of older breeds at a somewhat earlier time. It was not until 1853 that the Shropshires were deemed of sufficient importance to be recognised as a distinct breed by the Royal Agricultural Society; and the Oxfordshire Downs became known by that name as recently as 1857. The Suffolks

although an old breed, were not sufficiently improved until after 1865 to attract attention outside the eastern counties.

Noted Breeders.

The Booth family and Mr. Thomas Bates carried on the work of improvement with Shorthorn cattle, which the brothers Colling and Sir Charles Knightley had pursued with remarkable success. Mr. Bates died in 1850; but members of the Booth family carried on their successful breeding career for a great number of years, and long after the period under review. Among other noted breeders of Shorthorns in the early part of the period Sir Charles Knightley (whose career as a Shorthorn improver extended from 1826 to 1856), Earl Spencer, and Colonel Townley, may be named. Later on they became too numerous to mention in a condensed account. Messrs. Quartley and Mr. George Turner were among the famous improvers of Devon cattle in 1850. Although Hereford cattle had made great progress in the hands of Tomkins, Price, and others early in the century, it was not until 1846 that the Herd Book of the breed was started by Mr. Eyton, of Somerville, Shropshire. It was taken in hand later by Mr. Thomas Duckham, who edited the first volume containing anything like a complete record of the principal herds in 1858. From this time forward the breed grew rapidly in reputation, not only in England, but also in many foreign countries. In Scotland Hugh Watson and William McCombie were the most famous of the early improvers of Aberdeen-Angus cattle. The Sussex, Ayrshire, and Channel Islands breeds received great attention; but it is impossible to notice all the men who took a prominent part in their improvement. This remark may also be applied to the numerous improvers of horses, sheep, and pigs.

Agricultural Science.

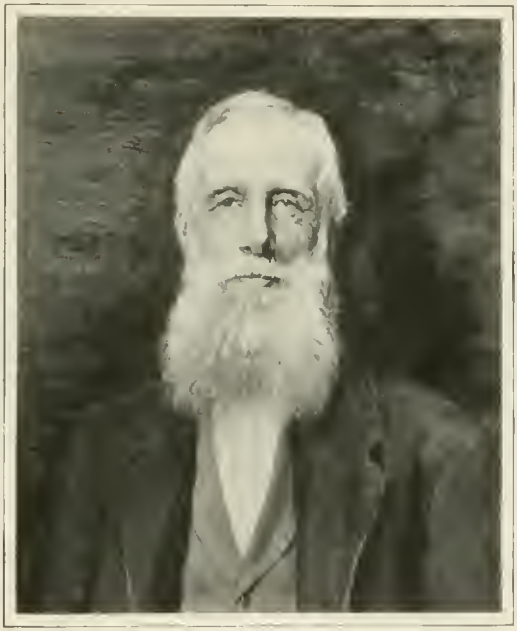
Liebig and Boussingault were the great names in 1846 in relation to agricultural science, and their teachings were popularised in this country by Johnstone and Voelcker, although there was much in Liebig's works to which English chemists, as well as the great Frenchman named above, were opposed. That Liebig carried his mineral theory to a great extreme was demonstrated by Boussingault, and later and more completely by Lawes and Gilbert, whose systematic experiments at Rothamsted were commenced in 1843, to be continuously carried on up to the present day (p. 264). In his "Natural Laws of Husbandry," published in 1863, Liebig still maintained that a loss of nitrogen in the soil would be more readily restored by natural agencies than

a loss of mineral ingredients, upon which plants feed in part; but by this time the Rothamsted field trials had conclusively proved the fallacy of that theory. Ville, in France, in 1849–52, carried out some experiments from which he concluded that plants grown in closed vessels accumulated nitrogen, obtained from the air. In 1855 Mené and Hartig published adverse results. Later on Hellriegel and Wilfarth demonstrated that leguminous plants, by means of minute organisms in the nodules on their roots, appropriated the nitrogen of the atmosphere, and their results were afterwards confirmed by Lawes and Gilbert. But no support has been given to Ville's theory in relation to non-leguminous plants. The Rev. W. L. Rham, who died in 1843, was one of the most instructive writers on agriculture, whose works popularised agricultural science during the period under notice. His principal work, "The Dictionary of the Farm," is valuable even at the present day. It was published as a collection of articles contributed by him to Knight's "Penny Cyclopædia," the last of which was written only a few weeks before his death. A new edition, with articles added by Dr. Lindley on planting, by Youatt on live stock, and by the Rev. Mr. Hickey on potatoes and poultry, appeared in 1850. Dr. Lindley was editor of the *Gardener's Chronicle and Agricultural Gazette*, and many of Mr. Rham's agricultural articles appeared in that journal; others, including a prize essay on the analysis of soils, being published in the Journal of the Royal Agricultural Society, with which body he was associated from its foundation in 1838. He also published "Flemish Husbandry," for the "Farmers' Series" of the Library of Useful Knowledge. Youatt, the famous author of "The Complete Grazier," a work much more comprehensive than its short title indicates, died in 1847; but his works were among the most popular of the agricultural treatises studied during the period under notice, and repeated editions of the one named have been published. Henry Stephens, author of "The Book of the Farm," three editions of which were published by 1867, helped to popularise scientific agriculture.

Agricultural Education.

The systematic teaching of scientific agriculture had hardly begun at the end of the period under notice. The Agricultural College at Cirencester, founded in 1845, was the only institution of its kind in England, and nothing besides the Chair of Agriculture at Edinburgh University, established in 1790, was known in

Scotland. In Ireland agricultural classes in elementary schools were started soon after the famine of 1846–47, only to prove failures, while the excellent Institution at Glasnevin, near Dublin, established in 1838 as an agricultural school for National School teachers, was reorganised in 1852, when the existing buildings were erected. Prince Albert, when visiting Ireland, showed so



SIR JOHN LAWES, BY H. VON HERKOMER, R.A.
(*By permission, from the Journal of the Royal Agricultural Society.*)

much interest in the model farm that it was named the Albert Farm. Agriculture was a special subject taught at a few country schools towards the end of the period or shortly afterwards, and it must be mentioned that the Rev. W. L. Rham had long before (in 1835) begun to teach the elements of practice with science in the school which he established at Winkfield, in Berkshire.

Scottish Agriculture.

In all the improvements mentioned previously as having taken place between 1846 and 1865 Scotland was in the van. In 1848 the Duke of Buccleuch proposed the establishment of a Chemical Department of the Highland and Agricultural Society

of Scotland, which was founded in 1784. The department was formed in 1849, and devoted itself to investigations in the chemistry of agriculture. Great attention was paid to the improvement of live stock, including Clydesdale horses. The Highland Society for some years before 1846 had encouraged the breeding of Shorthorn cattle in Scotland, and Scotch Shorthorns had acquired a high reputation before 1865. Mr. A. Cruickshank, Mr. Thomas Chrisp, and the Duke of Buccleuch were among the most successful exhibitors of the breed in 1852. By this time the Aberdeen-Angus cattle, in the hands of Mr. McCombie and others, had been considerably improved, and the Ayrshires and Galloways were receiving careful attention. Some breeds of sheep were well managed; but little had been done with the Blackfaced breed. There were few really good cheesemakers in Scotland at this time, and in 1854 a deputation was sent by the Ayrshire Agricultural Association to visit some of the cheese dairies of England. The members saw Cheddar made in the famous dairy of Mrs. Harding, in Somerset, and they recommended the Cheddar system, then hardly known in Scotland. In 1855 Mr. and Mrs. Harding were invited to Ayrshire to teach the dairy farmers of that county and neighbouring counties, and this was the foundation of the Scotch Cheddar cheese industry, which has since become one of considerable importance. At a later date the Canadian system of making this cheese was adopted under a famous Canadian instructor. There was no marked progress in butter-making until a much later time. Indeed, the cured butter for which the northern counties of Scotland were noted in 1850 was said many years later to have deteriorated. From 1853 to 1857 agricultural statistics were collected in Scotland for the Board of Trade through the agency of the Highland Society; but a dispute arose in the latter year, and the arrangement lapsed. It was not until 1866 that the statistics were collected through the officers of the Inland Revenue. Great attention was paid in Scotland to the improvement of turnips, with excellent results. Under the system of nineteen years' leases, rents rose steadily in Scotland. Speaking at Inverness in 1865 the Duke of Argyll referred to estates which had increased in value from less than £6,000 to nearly £70,000 during the preceding hundred years. But a century is a long

1865

period, and presumably the enormous increase occurred chiefly during an earlier portion of it rather than in that now under consideration. Between 1846 and 1865 the value of "lands" as assessed to income tax in Scotland rose from £5,509,014 to £6,830,639.

Irish Agriculture.

The famine of 1846 47 led to the ruin of a large number of tenants in Ireland, and their transference from the good cultivated land to the mountains and the margins of bogs. In their old

THE ROYAL AGRICULTURAL COLLEGE, CIRENCESTER.

places numbers of Scotchmen were installed in consolidated holdings, and the farming of Ireland was improved by the change, while native farmers were impoverished. In 1848 the Encumbered Estates Act was passed, with unsatisfactory results (p. 515), and in the same year the Irish Tenants' League was formed for the purpose of extending the Ulster custom of Tenant-Right to the rest of Ireland. The Landlord and Tenant Act of 1860 was not a response to this demand, but mainly a measure framed to base tenancy on contract, instead of upon custom or service. It had no considerable effect beyond making evictions more easy. This was the first of a long series of measures intended to put the relations of landlords and tenants in Ireland upon an improved footing; but nothing of importance was done during the period under notice. The wretched condition of the peasantry produced agitation and wholesale emigration, and

the Irish Land Question became a permanent trouble to Parliament, and a subject of inquiry by Royal Commissions. In spite of all, however, Irish agriculturists shared in the prosperity of their British neighbours during the decade ending with 1862, while the practice of farming improved, and rents advanced. Unfortunately the potato-disease, which had ruined thousands of tenants, had "come to stay," and distress recurred amongst the small occupiers with every bad season.

**A Bad Finish.**

In the last three years of the period the prices of corn fell seriously, the difference in respect of wheat between the averages of 1862 and 1863 being over 10s. a quarter. In 1864 wheat fell further to 40s. 2d. a quarter, and barley to 29s. 11d., while oats were reduced less seriously in value, selling at 20s. 1d. In 1862 the averages had been 55s. 5d., 35s. 1d., and 22s. 7d. But the crowning catastrophe remained for the year 1865, when Rinderpest, or Cattle Plague, was introduced into the country from Russia. We were quite unprepared to deal with this terrible disease, and consequently it spread without check through the country, causing an enormous amount of loss. In October, 1865, a Royal Commission commenced an inquiry into the origin, nature, and best method of encountering the fatal disease, and was sitting at the end of our period, nothing effectual having been done to stay the progress of the plague.

**J. E. SYMES. The New Era in Economics.**

THE adoption of Free Trade was followed by a great expansion of English commerce and wealth, but this expansion was temporarily delayed by the financial crash of 1847. Its history bore a great resemblance to that of the other decennial crises, which occurred with such regularity between 1826 and 1866. First came a series of good harvests in 1842, 1843, and 1844. This led to a great accumulation of capital, partly through agricultural prosperity, but chiefly because other classes of the community, being able to buy food cheaply, had money to spare for industrial and commercial enterprises. The development in railway and steamship communication operated in the same direction, for a saving in time is a saving in money, and the capital sunk in railway extension was now bringing in its returns. There was so great a glut of capital that the market rate of discount in 1844 sunk as low as one and three-quarters per cent. Then came the turn.

The failure of the Irish potato crops in 1845 and 1846 synchronised with bad English harvests, and an outburst of railway speculation (pp. 286, 311, 337). Thus prices were pushed up in two very different ways, and capital was locked up just when it was beginning to grow scarce. In April, 1847, the rate of discount on the best bills rose to ten and even twelve per cent., and in May the price of wheat touched one hundred and thirty-one shillings. Crisis of 1847.

SCARCITY OF CURRENCY IN 1847.

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There was an immediate rush to wheat importation, which reached such dimensions that the market was swamped and the importers were ruined. On the 9th of August the crash began, and in three weeks there were failures to the amount of over three million pounds. At first it was only the grain importers who stopped payment, but their fall dragged down the brokers who had made advances to them, and this spread the ruin to other houses till the failures exceeded fifteen million pounds. Extravagant credit had been given in the good times of 1845 and 1846, and now everyone was trying to realise, partly from the fear that his debtors might fail, and partly in fear of pressure from his

creditors. The Bank of England raised its rate and refused loans. Other banks hastened to sell their securities, and there were many failures among them, more especially in Manchester, Liverpool, and the North-West of England. At length, on October 25th, 1847, the Government advised the Bank of England to advance loans freely on good security at a high rate of interest, and promised that if it became necessary to exceed the limit of issue laid down in the Bank Act, Parliament should be asked to pass a Bill of Indemnity. As soon as this was known the panic subsided. The Bank Act, though suspended, was not violated. The mere knowledge that the directors had power to disregard it restored confidence to those houses that could offer good security, and the others had been by now, for the most part, swept away. The panic was over, but, as usual, it ushered in a period of depression, of general want of confidence and enterprise, and a consequent lack of employment.

Chartism Revived.

This state of feeling, combined with the spread of revolutionary ideas on the Continent, and especially in France, naturally tended to a revival of Chartism in England. The distinctive feature in the French Revolution of this year was the prominence of Socialistic ideas; and their triumph helped to re-awaken Socialist hopes in the minds of the more pronounced English Radicals. The Chartists formed what they called a National Convention, and used language so violent, at meetings so largely attended, that many well informed and intelligent people believed that England was on the verge of a revolution. As a first step Parliament was to be given a last chance of passing the Charter. A monster petition was to be presented by a vast mob who were to assemble at Kennington Common and to march down to the Houses of Parliament. This procession was prohibited, but the "physical force" Chartists were only the more determined to hold it, and they believed that the result would be street struggles and barricades, with a revolution as the outcome. The upper and middle classes were seriously alarmed, and the Duke of Wellington made elaborate military preparations. Two hundred thousand persons enrolled themselves to act as special constables against the Chartists. But the majority of the latter, however, shrank from the responsibility of appealing to force. A few thousands only assembled on Kennington Common, and, even of these, many were only attracted by curiosity. It was clear

1865]

that there was no chance of a revolution. The monster petition said to contain more than five million signatures, was presented to Parliament; but, when it came to be examined, it was found that the nominal signatures were little more than two millions in number, and that of these a large proportion were fictitious. The names of such illustrious persons as the Queen, Prince Albert, and the Duke of Wellington appeared again and again, and many purely humorous signatures had been appended by mischievous schoolboys and others. There was a reaction in the public mind from unreasonable terror to equally unreasonable contempt. Chartism was, in reality, no matter for ridicule. It was deeply rooted in misery and discontent, but, widespread as these were, there was no real danger of a revolution, and the commercial prosperity of 1853 to 1856 helped to mitigate the bitterness and despair of the poor. The name of Chartism became little more than a memory, but the facts which that movement had represented were embodied in few forms.

**The Ten Hours Act.**

From 1848 Chartism passed into comparative insignificance. The great revival of trade, of which we will speak later, contracted the area of misery and unemployment. The Factory Acts, Free Trade, and the New Poor Law were beginning to produce their beneficial results. The first of these had received an addition through the Ten Hours Act of 1847, which restricted the work of women and young persons engaged in textile factories to ten hours a day, between six a.m. and six p.m. They were not to be employed after two p.m. on Saturday. The principles of the Act were applied to other trades by a series of statutes between 1860 and 1864; and the restrictions practically introduced the same limit in the case of adult men in many industries. Free Trade, also, was extended by the abolition in 1849 and 1854 of all that remained of the Navigation Acts.

**Trade Unionism.**

But, above all, the more intelligent of the working classes were beginning to realise how much they had it in their power to do for themselves by means of their unions and without the help of Parliament. The need of more thorough and accurate knowledge of economic subjects began to be felt, and some of the unions devoted a portion of their funds to mutual improvement classes and the purchase of books. Their leaders began to denounce strikes, and to point out the need for more education both general and technical. Meanwhile the growth and

increasing complexity of the administrative work of the unions provided sufficient scope for the energies of the more clear-headed and practical-minded of their leaders.

The Amalgamated Engineers.

In 1848 a Manchester Engineering Society had 7,000 members, and a capital reserve fund of £27,000. It was admirably organised and financed, and in 1850 it was merged in a still larger and more famous society. There had been many opponents of the amalgamation, and during the process many of the old members seceded; but, by October, 1851, the Amalgamated Engineers could boast a muster roll of 11,000 members, all paying a shilling a week to the funds of the society. Their first great battle was fought over the question of piece-work and systematic overtime. The men suggested arbitration, but the masters would not consent, and on January 10th, 1852, every important engineering firm in London and Lancashire stopped work. The little band of Christian Socialists, whose leaders were F. D. Maurice and Charles Kingsley, exerted themselves to secure public sympathy and support for the men. A large part of the working classes, and no small number of the well-to-do, rushed into the contest, and considerable subscriptions were raised; but the employers were too strong, and, after a three months' struggle, the men were defeated. Their defeat did not shake their allegiance to their society, and it became a pattern on which many of their later national societies modelled themselves. For "benefit" purposes the society consisted of a number of local branches, practically self-governed, but subject to a general code interpreted by a central executive committee. But, for fighting purposes, power was centralised in the hands of this executive. They rigidly restricted membership to duly qualified men in the trade, and banished from their programme the vague general philanthropy which had characterised the earlier movements, more especially during the dominance of Robert Owen's influence. The unions now made it their prime business to advance the interests of their own trade, and left other people's interests to be looked after by other people. Occasionally, however, they gave liberal help to other unions engaged in contests with the objects of which they were in sympathy. Within ten years of the great strike the engineers had doubled their numbers, and had accumulated £73,000. With such financial interests at stake the union leaders became anxious to avoid strikes, and between 1852 and

1865]

1858 there were comparatively few of these, and none on a large scale. In 1859, however, there was a great strike in the building trades of London in favour of shortened hours of labour.

THE REV. CHARLES KINGSLEY BY LOWES DICKINSON.
(*Magdalene College, Cambridge.*)

Twenty-four thousand men were locked out. Public sympathy was roused for the men. The Amalgamated Engineers contributed three successive weekly gifts of £1,000, and much other help was forthcoming. This time the battle ended in a compromise, one result of which was the formation of the Amalgamated Carpenters' Society, and of the London Trades Council.

The Builders' Strike, 1859.

The Trades Council.

The forming of the latter marks a new departure in the history of industry. The leaders of trade unionism were once more feeling the need of some organisation, not restricted to a single trade or group of trades. Some of those who had co-operated to help the builders decided to form a permanent council, representing various distinct trades, which should be an organ of inter-communication, and a channel of mutual help. The Council held its first meeting on July 10th, 1860, and, at about the same time, provincial Councils began to be formed, with the same general objects, in many of the large towns Another new departure was a revived political activity As soon as the chief separate trades were fairly efficiently organised, the need of common political action began to be felt. Men found that, as unionists, they were keenly interested in the movement to extend the franchise, and thus to secure increased political power for their own class. They were anxious to extend the Factory Acts, and to do away with the little that remained of legal impediment to combination. Gradually they began to take part even in those political matters which had little, if anything, to do with definite trade interests. Thus, the London Trades Council took an active part in the popular welcome to Garibaldi, and in a meeting to show sympathy with the Northern States of America. Many trade unionists protested against this tendency, which seemed to them to savour too much of sentiment, but the general feeling, among the leaders at any rate, was in the other direction.

The Co-operative Movement.

Meanwhile the Co-operative movement had fairly started on its victorious career. Its original object was essentially ethical. The word was primarily used as an antithesis to competition, and Co-operation was rather a faith and a principle of life than a mere system of profitable shopping and store-keeping. Robert Owen (p. 304) may be said to be the founder of the English Co-operative movement. Before his ideas had taken a democratic turn he had aimed, in New Lanark, at fighting the evils of competition by making the national and social conditions of the workmen his first care. The relation of employer to employed was to be one of co-operation; for the advantage of each would involve the advantage of the other. Owen, in his earlier days, believed that the social problem could be solved by competent and benevolent captains of industry, but experience convinced him that this was impracticable. Next, he looked to the State to

organise co-operative communities. Only very gradually did he come to believe that the workers must create for themselves some system which would dispense with employers; and he never attained to any firm conviction of how this was to be done. The provision shop, which he ran without profit at New Lanark, suggested to some of his disciples the idea of founding co-operative shops by means of £1 shares. Owen himself, however, took little interest in this, and seems to have feared that it might withdraw men from the pursuit of the social millennium. Other experiments followed, but these were initiated for the most part by philanthropic people for the benefit of the working classes.

The Rochdale Pioneers.

At length, in 1844, twenty-eight Rochdale men started a business for themselves, with a capital of only one pound each, and that slowly saved up, often at the rate of twopence a week. This was the first store which successfully solved the problem of eliminating the shopkeeper from a shopkeeping business.

This seems to be the distinctive feature of what is called *Distributive Co-operation*. The other points on which the Rochdale Pioneers insisted are not essentially co-operative. Supplying only the best goods, giving full weight, allowing and asking no credit, were, no doubt, important features in their success, but there is nothing in them inconsistent with ordinary shopkeeping, whereas the democratic management and the division of profits among members and customers were the essential characteristics of the Rochdale experiment. The progress which it made during the period dealt with in this chapter is indicated by the following figures:—

| Year. | No. of Members. | Business. | Profits. |
|---|---|---|---|
| 1845 ... | 74 ... | £710 ... | £22 |
| 1855 ... | 1,400 ... | £44,906 ... | £3,109 |
| 1865 ... | 5,326 ... | £196,234 ... | £25,156 |

Co-operation, 1845-1865.

The success of this Society naturally led to the formation of others more or less on the same lines. Some were successful; others failed. The varying results were largely due to the degree of competence attained in their management; partly to good or bad luck; but, broadly speaking, it may be said that no great success attended any form of co-operative production during this period. The principle of dividing among labourers as such, *i.e.* in some sort of proportion to the results of their labour, was altogether dropped in many cases, and only carried out to an

inconsiderable extent in others. The workman might profit by investing his little capital in the store, by obtaining good and cheap provisions, in addition to a share in the dividend proportional to his purchases; but the success of such stores has done little to show the feasibility of schemes to enable the worker, as such, to gain an increased share in the product of his work. Co-operative workshops, started with this idea, generally either failed or abandoned the principle, and became merely joint stock concerns, in which the stock was held by workmen. This was the case, even in the mills set up by the Rochdale Pioneers. The original idea was to allow the shareholders five per cent., together with half any further profits, leaving the rest to be divided among the workmen; but this scheme was soon abandoned, and the mills were henceforth conducted as joint stock companies.

The Co-operative movement, though it owed its success mainly to workmen co-operators themselves, had many useful allies and champions among other classes. The Christian Socialists warmly supported the movement, though they felt that it fell far short of their ideal. One of their number, Mr. E. V. Neale, rendered specially useful service by drafting and carrying through the Bill for the amendment of the Industrial Societies Act, which gave full legal protection to the funds of the stores and removed various restrictions under which they lay. This gave a great stimulus to the movement, and by 1865 there were 124,659 members of co-operative societies, whose sales amounted during the year to £6,001,153.

Growth of Trade.

The progress of Trade Unionism and Co-operation during this period, was, no doubt, partly due to the steady increase of national wealth, which made it possible for the working classes to improve their position. This progress in wealth was undoubtedly largely due to the adoption of the Free Trade system. In 1851, when much had already been done in this direction, our imports were valued at one hundred millions, and our exports (including re-exports) were under seventy-five millions. By 1856 these figures had risen, the imports to over one hundred and seventy-two, and the exports to one hundred and sixteen millions. By 1865 they had exceeded what appeared to be the marvellous amounts of two hundred and seventy-one and one hundred and sixty-five millions. In other words our imports had nearly trebled, and our exports more than doubled in fifteen

years. The statistics of foreign trade are, no doubt, imperfect evidences of general material progress, but all the facts and figures at our disposal confirm the belief that England's wealth was increasing with extraordinary rapidity.

The progress was, however, not unbroken. The year 1857 brought another of those crises and panics, which appeared to

THE AMERICAN CRISIS OF 1857.
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recur at regular decennial periods. There had been such crises in 1826, 1836, and 1847. Since this last date the country had gone through the regular cycle. The panic had been followed by several years of depressed trade, during which wages were low, employment scarce, and profits on capital insufficient to tempt enterprise. Gradually, however, confidence revived, and men were more prepared to stake the slow accumulation of the bad years. The Crimean War (1854–56) gave an artificial stimulus to trade, and in 1855 confidence passed far beyond the bounds of prudence. Credit began to be recklessly given. Many large

The Crisis of 1857.

operators kept practically no reserve, trusting to the Bank of England to help them. A wave of excessive railway speculation in America helped to swell the general excitement, and in 1856 the crash began in the United States. It was found that many companies had been paying dividends which they had not earned. There was a panic in New York, in which sixty-two of the sixty-three banks in that city stopped payment. Thus the English crisis was precipitated. Firms with large American dealings began to totter. Failures in Liverpool and Glasgow reacted on London. Failures in one trade brought disaster to others. There followed a repetition on a large scale of the scenes of 1847. The bank rate went up to nine per cent., but the reserves nevertheless sank so low that the Bank of England would have had to stop payment on November 13th, 1857, but for the suspension of the Bank Charter Act. Under this suspension the Bank issued nearly a million pounds in notes in excess of the ordinary legal limit. This shows that the crisis was even more intense than that of 1847 (p. 489). With the suspension of the Act and the raising of the rate the panic soon passed away, and indeed confidence revived somewhat sooner than had been the case in the previous crises.

Limited Liability.

This revival of confidence was greatly encouraged by the new facilities given to trading, with only limited liability, under the Act of 1862. This Act made it easy for any seven or more persons to be incorporated with or without limited liability, and with various special privileges. The result was an extensive formation of joint stock companies, many of which were of a dishonest or dangerously speculative character; but there can be no doubt that the Act led also to a great development of legitimate trade.

More Free Trade, 1853-1860.

In spite of the reforms of Huskisson and Peel (pp. 121, 163, 310) our system of Customs was still very complicated, and in many ways Protective. It was reserved for Gladstone to complete the edifice of which Huskisson had laid the foundation, and towards which Peel, in abolishing the corn laws, had contributed the most important part. Gladstone's Budget of 1853 freed no less than one hundred and twenty-three different kinds of goods from Customs duties, and reduced the rates on one hundred and forty more. Its first principle was that Customs duties should only be levied for purposes of revenue, and in no

degree for the protection of native industries. Unproductive duties were, therefore, to be swept away. Secondly, a great reduction was made upon articles of food which were of general consumption, such as tea, butter, eggs, apples, cheese. Thirdly, all duties upon half-manufactured goods were to be abolished. Fourthly, a great simplification was introduced by getting rid, to a great extent, of differential and *ad valorem* duties. Even these sweeping changes were intended only as another step towards thorough Free Trade. The Crimean War necessitated the delay of further reductions and abolitions of duties, but in 1860 the work was resumed. The Budgets are too elaborate to be explained in detail here, but, by way of summary, it may be mentioned that under that of 1842 no less than 1,052 kinds of articles paid duty. By 1853 the number had fallen to 466, and by 1860 to forty-eight. Between that year and the end of our period the reduction had been carried further. The Free Trade principle is that so-called "Protection" injures instead of protecting. If other people damage us by taxing our exports, that is no reason why we should damage ourselves still further by taxing theirs. Accordingly, when England in 1860 made a Treaty with Napoleon III., she was really conceding nothing, but merely carrying her own principles one step further, and purchasing one advantage at the cost of obtaining another. The same thing held good of Napoleon. He was genuinely convinced that France would benefit by opening her ports more freely to English exports, but this view was by no means popular in France. It was, therefore, necessary to secure support, by making the relaxation nominally compensated for by a similar relaxation of the English tariff. Hitherto France had absolutely declined to take many kinds of imports, but by the terms of the Treaty all these were to be admitted on payment of a duty never exceeding thirty per cent. of the value of the goods, and a number of existing duties were to be reduced. The result was, in the first place, a great increase in the trade between England and France; and, secondly, the setting of an example which was speedily followed. The chief European powers bound themselves, by a variety of treaties, to modify their tariffs if the other contracting nations would make corresponding relaxations. Under the new system, international trade grew very rapidly. It is possible, however,

**The Cobden Treaty, 1860.**

**Commercial Treaties.**

that the treaties helped to fix in the popular mind that hostility to foreign imports which combined with financial difficulties to bring about a great Protective reaction which only England escaped.

The Gold Discoveries.

Some brief mention must next be made of the great discoveries of gold (California, 1848: Australia, 1851, etc.). The consequent revolution in the supply of gold may be realised from the fact that in the ten years 1841–50 the average annual production of gold in the world had been worth about seven and a half million pounds; but in the next ten years it rose to about twenty-eight million pounds. It naturally followed that the value of gold, in terms of most articles, rapidly fell, or, in other words, that general prices rapidly rose. This acted as a great stimulus to industry. But some classes of the community suffered severely. Those who had fixed incomes, derived for instance from preference shares, fixed dividends, or annuities, found that the old income would no longer buy the comforts to which they were accustomed. Moreover, many of those who, in the first instance, profited by the change, were tempted into extravagances which sometimes took forms permanently injurious to industrial efficiency. Accordingly we find that, from about 1860 the number of paupers began to increase, as shown by the following table:—

The Effects.

Pauperism.

ENGLAND AND WALES.

| Year ending Lady Day. | Mean No. Indoors. | Mean No. Outdoors. | Total Mean No |
|---|---|---|---|
| 1860 .. | 113,507 ... | 731,126 .. | 844,633 |
| 1861 ... | 125,866 ... | 758,055 ... | 883,921 |
| 1862 ... | 132,236 ... | 784,906 ... | 917,142 |
| 1863 ... | 136,907 .. | 942,475 ... | 1,079,382 |

The increase was even more rapid than that of the population. No doubt the Cotton Famine partly accounts for that of the later years. The American Civil War brought with it a blockade of the ports whence the materials for the staple trade of Lancashire had been chiefly exported (pp. 357, 796). This caused terrible distress; and though the brave endurance of the operatives, and a national subscription amounting in April, 1863, to upwards of two millions sterling, prevented the extension of pauperism which might have been anticipated, yet many trades suffered indirectly from the distress of Lancashire.

Others, however, were stimulated by the American War. It may be that the "good" times made Guardians more lax, and, at any rate, these years were exceptional. From 1864 the decline that had been going on under the new Poor Law was resumed; but it is at least curious that, even for these four years, rising wages and increased facilities for obtaining work did not prevent an increase of pauperism.

If we try to summarise our industrial history for the period

THE COTTON FAMINE: DISTRIBUTION OF CLOTHES TO OPERATIVES, MANCHESTER.
(*By permission of the Proprietors of the "Illustrated London News,"* 1862.)

dealt with in this chapter, we must still give the first place to the increase of population, and the still greater increase of wealth. In Ireland, indeed, the potato failure started that flow of emigration which has gradually reduced the population of the sister island from over eight millions to under four and a half millions. But the increase in the other parts of the United Kingdom more than balanced the decrease; and the continued improvements of machinery, combined with the extension of production on a large scale, caused great accretions of wealth. We must notice, however, that the industrial revolution had now extended to the Continent, and that the

Summary.

railway expansion which, in England, was most striking in the years 1844 and 1845, was now specially affecting the other countries of Europe and the United States, and had, by the latter part of our period, reached India and other regions which were in a more backward industrial stage. The telegraph, also, was rapidly becoming a most important factor in industry and commerce. The Crimean War, the Indian Mutiny, and the American Civil War must have somewhat hindered the accumulation of wealth, even when they gave a temporary stimulus to trade. Financial crises brought ruin to many, but the favourable forces were so strong that the destructive influences of over-speculation and panics did not prevent continued material progress. Of these favouring forces the gold discoveries were hardly less important than the mechanical improvements and the more efficient organisation of manufacture. Next to these we must put Free Trade; but to those who care more about the distribution of wealth than about its production, and who attach more importance to the physical, moral, and intellectual qualities of the people, than to the multiplication of their comforts and luxuries, the foremost place must be given to the growing power of trade unions, the improvements in factory and mining laws, and the beginnings of modern sanitary legislation. The English working classes were now reaping the fruits of the legislation of 1833 and 1834, as well as of the improvements made during the period dealt with in this chapter; and they were also discovering how much they had it in their power to do by their own efforts.

MARY BATESON. Social Life: The Theatre. 1815 1885.

From 1815 to 1843, when the new Act regulating theatres was passed, war was continuously waged on the patent rights of Covent Garden and Drury Lane, whose prescriptive right to perform the "legitimate drama" was enforced by the Lord Chamberlain under the Act of 1737. Certain exceptions were allowed; for instance, "legitimate" at the Haymarket in the summer months, musical performances at the Lyceum and St. James's (then the Prince's), burlettas at the Olympic and the Adelphi. *Othello* was converted into a musical performance by striking a few chords behind the scenes at frequent intervals;

five pieces of vocal music in each act made a play "burletta" beyond risk of contention. The result of the law was to discourage the performance of the plays of all the greatest English playwrights; for people would not go to Covent Garden and Drury Lane to hear them—indeed, they could not hear them if they did go, for the new school of actors had not voice enough to fill large houses that had been well suited to the powerful declamatory style of the elder Kembles. The law was openly defied by the Strand Theatre, and a number of large theatres outside the limits of Westminster existed on sufferance. The two great houses ruined the managers, and their rights could not be enforced in the law courts, for public opinion was too strongly against them. After 1832, when a Parliamentary Committee was held to consider what change in the licensing laws was possible, the minor theatres encountered no further difficulty.

**The Great Tragedian.**

The beginning of our period was the end of the old style. Mrs. Siddons made her last appearance in 1812, appearing only for a benefit in 1819; J. P. Kemble made his last appearance in 1817. From 1818 to 1833 may be dated the period of Edmund Kean, the first period of Macready, and the entertainments at the Lyceum by the elder Mathews. Those who saw the acting of Kean ascribe to him pre-eminently the quality of inspiration. He had intensity by nature, whereas Macready's motto was "Patience is genius." Macready, by mere force of his massive physique, was passionate, whereas Kean showed more of the intellectual aspects of passion. Macready's masculine energy, his "Homeric" quality, as Mr. Westland Marston describes it, contrasted strongly with the graceful charm of his contemporary, Charles Kemble, whose Hamlet, Mercutio, Orlando, Benedick, best displayed his talents. With less pomposity and more of natural sentiment, he succeeded best where Macready was least successful.

**Famous Plays and Players.**

The 'thirties date the opening and closing of many famous theatrical careers: Charles Young is last heard of in 1832, Edmund Kean in 1833, Charles Kemble in 1836, Liston in 1837. From 1837 dates the second period of Macready, which covers his career as a manager, with many failures, first at Covent Garden, then (1841) at Drury Lane. The 'thirties saw Fanny Kemble's efforts to support her failing father, and Helen

Faucit's first appearance, with those of Phelps and the younger Mathews. The fashion for inflated rhetoric showed very little tendency to wane. The great plays were Sheridan Knowles's *Virginius* (1820), *The Hunchback* (1832), *Love* (1839), in which Ellen Tree (Mrs. Charles Kean) had great success. The piece ran for fifty nights, which was then considered extraordinary. Bulwer's *Lady of Lyons*, threatened at first with failure, ran

EDMUND KEAN, BY J. S. STUMP.
(*National Portrait Gallery.*)

thirty nights in its first season, and was accounted a great success, for twelve or fourteen nights were more usual runs. Talfourd's *Ion*, Byron's *Marino Faliero* drew well; in 1840 *Money* came out, and showed that high-flown sentiment was still in vogue. What was sometimes wanting in quality was made up in quantity: the bill consisted of either two five-act comedies, or a tragedy preceded by a farce and followed by a three-act comedy.

The legitimate drama entered upon a new era when Samuel

THE TRIAL SCENE IN *HENRY VIII.*, BY F. LLOYD.

*(Keene Collection, Victoria and Albert Museum.)*

1865]

Phelps, with Mrs. Warner, took the management of Sadler's Wells, Islington. Phelps followed the methods of Macready, but had not his vigour. Phelps, however, believed himself to be the apostle of a cause—so Mr. Marston calls him—and as such the public willingly accepted an education at his hands. He could act parts of every description, and appeared in at least thirty Shakespearian characters. Though he never excelled by force of inspiration of passion or sentiment, he knew his audience, and delivered his words slowly and audibly, making little of himself and everything of his author. In eighteen seasons he produced thirty-one of Shakespeare's plays, free from eighteenth-century "improvements," and further revived many plays of the seventeenth and eighteenth century classics. The literary world went nightly on pilgrimage to "the Wells," Islington. Nearer home, Charles Kean, as manager of the Princess's from 1850, was doing similar work. He rejected the theatricality and point-making of his predecessors; and though he failed sometimes in tragic power through his eagerness to represent rather the quietude of nature, he educated people to appreciate more refined methods. He cared much for historical accuracy: his pageants, dresses, and scenery, to which Stanfield brought his artistic skill, surpassed the efforts of his predecessors. This was the period of dramatised versions of Dickens's novels, of Buckstone's *Jack Sheppard*, of Boucicault's *London Assurance*, and of some of the best known plays of Tom Taylor and Charles Reade. The Legitimate Drama.

In 1841 Rachel had shown London the best traditions of the French classical drama, and people were reading Racine as something more than a painful school task or study in literature. In 1857 came Ristori, and those who had seen Rachel found it hard to choose between them; Marston thought Rachel the more grand and terrible, Ristori the more human, with more power to excite pity and compassion in such a part as Phèdre. In 1857 her Lady Macbeth, in Italian, was the world's talk. The American actress, Charlotte Cushman, who acted Romeo to her sister's Juliet, in 1846, and the French actor, Fechter, had qualities of the greatest tragic power. In 1855 the periods appear to divide again. In that year William Farren, the elder, retired, and with him the stage lost the best player of Sir Anthony Absolute, Sir Peter Teazle, and the courtly gentle-

man of the last century. In the following year Ellen Terry made her first appearance, under Kean's management, in a child's part. With the 'sixties begins the period of Robertson's plays: *David Garrick*, *Society*, *Ours*, *Caste*, *Play*, and *School*; of H. J. Byron's management of the Prince of Wales's Theatre, formerly the Queen's; of the first important appearances of Mr. Bancroft, Mr. Hare, Mr. Irving, Mrs. Kendal, and Mr. Wyndham. In 1875 H. J. Byron gave to the Vaudeville

SCENE FROM *OURS*, AT THE PRINCE OF WALES'S THEATRE.
(*Reproduced, by permission, from the "Illustrated London News,"* 1866.)

Theatre *Our Boys*, which ran for more than four years. For a time English dramatic invention, except in melodrama and farce, seemed at a standstill.

**Fashionable Manners.**

In 1833 a new social excitement was the bazaar. One of the first, held to aid foreigners in distress, is described by Greville as like a masquerade without masks, everybody talking to everybody, whether already acquainted or not. The bazaar developed the female passion for "fancy work," and for imitating legitimate arts in inappropriate materials. Leather was cut to appear like wood-carving; potichomania had its victims, who spent their days in fastening pieces of cut paper on to vases

INTERIOR OF HER MAJESTY'S THEATRE: CLOSE OF THE SEASON OF 1841, FAREWELL OF MLLE RACHEL, BY E. L. LAMI.

*(Victoria and Albert Museum.)*

and painting them with glaze. In more serious circles electric experiments were a favourite pastime, and animal magnetism, neuro-hypnotism, electro-biology were words in every cultured person's mouth. The kaleidoscopes, aërostation, aërial ships, diving-bells of 1820, had been displaced as interesting topics of conversation by mesmerism, clairvoyance, clairaudience. Modern spiritualism came to England from America in the early 'fifties, and the literary and fashionable world found in the séances of D. D. Home and other mediums an all-absorbing interest. Lord Lyndhurst, Sir E. Bulwer-Lytton,[1] Mr. Monckton Milnes,[2] Lord Lindsay,[3] Lord Adare, the Trollopes, the Howitts, Mrs. Browning, Mrs. S. C. Hall, Dr Gully of Malvern, are among those whose names occur frequently in the astonishing literature that belongs to this subject.

Newspapers.

The object of the stamp duty on newspapers had been partly to raise money, but also to keep periodical literature for the moneyed classes, and out of the hands of those who, writing for the poor, might pander to the democratic and revolutionary fancies of the populace. It was, however, always possible to evade the duty, and Cobbett, by having no news in his paper, was able to reduce the price of his *Weekly Register* from 1s. 0½d. to 2d., and thereby obtained an enormous influence. Irregular publication also exempted from duty, and as convictions were found powerless to stop the circulation of unstamped papers, a vast number were in circulation at 1d. or 2d. each. These pirate papers were generally inferior in quality, and it was seen that the effect of the stamp duty was injurious in that it cut off the poor and ignorant from the best sources of information. The annual cost of a daily paper to a subscriber was, in 1818, £10, and even the well-to-do combined to reduce the expense. Agents circulated them at 1d. an hour, and when they were "a few days old" they were sent to provincial towns and through the country at reduced prices. Whilst the stamp duty stood at 4d. the issue of stamps to British newspapers was, in 1835, not quite 33,000,000 for a population of about 25,000,000. Next year the tax was reduced

[1] The first Lord Lytton. [2] Lord Houghton.

[3] Afterwards Earl of Crawford and Balcarres. The theft of his dead body, probably for ransom, in 1881, and its recovery some years afterwards, constituted one of the most curious chapters in nineteenth-century criminology.]

1865]

to 1d. the sheet, and the duty on paper was also reduced. The yield rose, and in 1843 the issue of stamps was about 56,500,000, at the time when old-established papers were selling at 5d. instead of 7d. each. In 1853 the duty was reduced to 1d., and in 1855 it was abolished, together with the advertisement tax, which had been at the rate of 3s. 6d. each. The chief London dailies in 1835 were the *Times*, *Morning Chronicle*, the *Standard* (an evening paper till 1857), *Globe*, *John Bull*, the *Morning Post*. The *Courier* no longer held the position as an evening paper which it had kept during the war, with a daily circulation of 10,000.

The "Times."

In 1814 the *Times* began to be printed by steam, and instead of producing 450 copies in an hour produced 1,100 sheets. By 1836 this number was again more than doubled, while in 1884 22,000 sheets were produced in the hour. In 1816, when Barnes began to edit the paper, the circulation averaged only 5,000 copies; each copy consisted of one sheet of four pages. By 1834 the circulation had doubled, and its influence on public opinion was very great. Barnes was for the Reform Bill, and was called a "desperate Radical"; but afterwards Brougham and he parted company, and the tone of the leading articles, an enormous number of which were of Barnes' writing, was changed. In 1841 he was succeeded by Delane, who, though he was no writer, was able by means of his social gifts to make a position in society and in politics which no journalist had before attained. In 1828 it had been thought odd that the Lord Chancellor should have the editor of the *Times* to dinner; but in Lord Palmerston's time a close alliance was formed between the Ministry and Delane. Both Barnes and Delane seized readily on any available means to obtain information rapidly, and before the days of rail and telegraph performed marvellous feats with their expresses. In 1834 Barnes got news from Glasgow, which was brought by horses posting 400 miles at an average rate of fifteen miles an hour. By 1854 the circulation of the *Times* far exceeded that of all the principal dailies; it stood at nearly 52,000 when the *Morning Advertiser* stood at near 8,000, the *Daily News* over 4,000, the *Morning Herald* near 4,000, the *Morning Chronicle* and *Morning Post* near 3,000. In 1884 the least daily issue of the *Daily News*, *Daily Telegraph*, and *Standard* exceeded 170,000.

The *Morning Chronicle*, in spite of its small circulation, had

Other Papers.

a high reputation under the editorship of James Perry (1789–1821). Perry was the first to introduce shorthand reporting of Parliamentary speeches, and was thus enabled to print in the morning the speech of the previous night. The *Morning Post* was remarkable for its poetry, and it was here that Wordsworth published his sonnets, while Moore, Southey, and Young also wrote for it. The London daily press had among its contributors Lamb, Leigh Hunt, Hazlitt, S. T. Coleridge, T. Campbell, James Macintosh, Dickens, and a host of other famous writers. It would appear that journalism was then less professional and more literary in its character than it is now, but the result probably was that a less uniformly good level was obtained. There was, perhaps, more distinction and variety of style than is now suffered, but the average was lower, and one piece of brilliant writing went to make up for much of inferior quality. The news which each paper nowadays has to announce is as a rule the same; in former times there was more scope for extraordinary feats of editorial activity in capturing news; now more care is taken as to the form in which it is presented. In 1834 not a single provincial town in England issued a daily paper. Liverpool and Canterbury alone issued papers more than once a week. In 1855 the total of provincial papers for the United Kingdom was 560, in 1883, 1,576, of which 162 were dailies. But the growth of the newspaper press in England is very small compared with the growth in the United States; it appears, however, that English taste in journalism follows, though slowly, upon American models. It would seem that humanity develops new instincts and new desires according as invention suggests them and provides facilities for satisfying them. The desire to read much about events or about persons, the wish to have or to send news, was not felt when it could not be gratified; and now, with the means to quench it, has been raised an as yet unquenchable thirst. The mischief, if mischief it be, is all due to steam; neither the abolition of stamp taxes nor all the administrative reforms of Rowland Hill could have created these monster needs, for they could not have satisfied them. Steam has shown how impossible it is to lay down any law concerning what is necessary for the happiness of humanity.

1865]

JAMES COLVILLE. Scotland.

The Potato Famine.

Pauperism.

Social Reform.

THE failure of the potato produced widespread destitution, aggravated by long-continued trade depression. Following this drain on the resources of the community came "the malignant fever" of 1847, decimating the ranks of the unemployed poor. The mortality of Glasgow for the year was hitherto unprecedented in any British community. The cost of poor relief rose, 1843–48, from over a quarter of a million a year to more than double. But it was in the Highlands and the Isles where the pinch was most keenly felt. There the economic crisis was aggravated by over-population, a vicious land system, and an uncertain climate. Emigration had long been checked through the easy sustenance of the potato and the profits of kelp-burning, an industry which collapsed after 1851 through chemical discovery and the change of import duties. The crofter system, which came in the wake of the sheep clearances, fostered unwise subletting and the squatting of a needy crowd of dependants without regular employment, landless, and ignorant. The Relief Committee, reporting on a large district in 1849, found a third of the population dependent on their crofter neighbours, little better off than themselves. The benevolent in the larger towns, the clergy of all denominations, and the Highland landlords made heroic efforts to cope with the distress. All over the country the growing mass of unemployed, due to the stagnation of trade (1849) that followed the famine, and the collapse of credit in 1848, put a great strain on the new Poor Law. There was, therefore, not a little agitation for the enactment of a legal claim for relief to the able-bodied but unemployed poor as in England. But even without this the registered poor were nearly doubled in numbers during this period. The ratio they bore to the whole population was 3·85 per cent. (1847–67), afterwards reduced to 2·2 (1871–91). To these results the reluctant resort to the workhouse test, characteristic of Scotland, contributed not a little.

Contemporary observers were of opinion that more harm than good was done by the liberal charity which the economic crisis elicited. Elementary education was still in a deplorable condition. Government, too, became alarmed in 1856 at the amount of the education vote, which had risen in a few years from £60,000 to £500,000. The State was now assuming responsibility for the education of juvenile criminals, giving a great impetus to that industrial school movement which Dr. Guthrie's "Plea for

Ragged Schools" (1847) inaugurated. He was a moving spirit in the Association for the Suppression of Drunkenness (1850), the outcome of which was the Forbes-Mackenzie Act (1853). It effectually cleared the streets of nocturnal and Sunday revelry, so that it would be hard to name an Act which has done so much for social reform. City Corporations were awakening to a higher sense of duty towards the helpless classes. Glasgow's first Extension Act (1846) took in a crowd of squalid villages on the borders of the old parliamentary area, leading speedily to the introduction of Loch Katrine water (1859) and the creation of the City Improvement Trust (1866). Private enterprise, anticipating the wants of the extended area and changes of social customs, gave Glasgow her first supply of city 'buses, developed from modest beginnings in 1846 to a complete system in 1850.

Ship-building.

The high position of Clyde shipbuilding dates from Robert Napier's success with the first four Cunarders (1840). When Samuel Cunard failed to find support in the South for his mail scheme, he betook himself to Glasgow, where, with the commercial help of George Burns, and the engineering skill of Robert Napier, it was at length fairly launched (p. 459.) The subsequent steps in progress were worked out here also—substitution of iron for wood and the screw for the paddle, along with those improvements in boilers and engines which made steam available and economical for ocean sailing. Kincaid of Greenock, after experiments dating from 1828, succeeded in 1840 with a four-bladed screw-propeller, but not till 1850 could the Clyde claim her first screw-steamer (p. 180). About 1858 iron and the screw took a permanent place. To the close of the Crimean War belongs the first general use of iron in warships (p. 178). The *Black Prince*, an ironclad built at Govan in 1860, ushered in the long series of Clyde-built additions to our fleet. The famous engineers, Randolph and Elder (afterwards John Elder and Co.),[1] of Fairfield-on-Clyde (1852), applied their exceptional skill to that economy of fuel and efficiency of steam propulsion which have made the Atlantic Ferry what it is. The first warship supplied with their notable invention, the compound engine (pp. 460), was strikingly successful on trial (1865).

The period was remarkable for the part played by chemistry in

[1 Now the Fairfield Shipbuilding and Engineering Company.]

THEIR ONLY HARVEST, BY COLIN HUNTER, A.R.A.

*(National Gallery of British Art)*

1365]

the arts. The manufacture of bichromate of potash, used as a mordant in dyeing, was so highly developed at Shawfield, near Glasgow, that the output here soon equalled that of all the kingdom combined. The shale-oil industry, again, owed much to the

New Industries.

DR. GUTHRIE AMONG THE STREET ARABS OF EDINBURGH.
*(From the engraving by J. Le Conte. After James Edgar.)*

technical education of the Glasgow Andersonian College, for here Young worked and studied under Thomas Graham. Finding the bituminous coal of Boghead, near Bathgate (1850), rich in oil, Young established there a vast industry. Paraffin had been discovered (1830) independently by Reichenbach and by Christison of Edinburgh To the early studies of the latter

(1818) was also due the application of naphtha as the best solvent of india-rubber. But Macintosh of Glasgow and Hancock of Liverpool stepped in here, and reaped all the honour and profit. Large rubber (1855) and vulcanite (1862) works were set agoing in Edinburgh. Floor-cloth making was successfully established in 1847 at Kirkcaldy, and this, the cradle of the industry, is still without a rival in the trade.

P. W. JOYCE. Ireland.

After the proclamation of the Clontarf meeting in 1843 (p. 338) there was a serious split in the Repeal party. The younger men grew tired of O'Connell's method of peaceful constitutional agitation, as leading to nothing; stronger views began to prevail among them; and a number of them—all men of great ability and of the highest character—seceded and formed what is known as the Young Ireland party. O'Connell had mainly worked for and by Catholics, but these men entered on the task of uniting the whole of the Irish people of all religions in one grand organisation. Their organ was the *Nation*, a weekly paper, founded by Thomas Davis, a Protestant, and by Charles Gavan Duffy and John Blake Dillon, two Catholics. Meantime the famine came; O'Connell died; and in 1848 the Young Ireland party sprang at once into great prominence. The *Nation* continued to be conducted with great literary ability: but several other papers of a much more violent character were started by men of more advanced opinions, conspicuous among whom was John Mitchel, a Unitarian, the most powerful and daring writer of them all. At last, in 1848, the Government issued a number of warrants; and there was an abortive rising under William Smith O'Brien, Dillon, Thomas Francis Meagher, and others. The leaders were nearly all arrested and sentenced to various terms of penal servitude. It may be said that this brought to a close the brilliant and brief Young Ireland movement.

"Young Ireland."

The Land War.

The land troubles inherited from the bad old times of the Plantations reached an acute stage in the years following the famine. Those of the tenants who survived that calamity came out of the trial utterly impoverished; the landlords pressed for impossible rents, and evictions came by the thousand. In Ireland, as a rule, the tenants made all the farm improvements:—changing moorland into arable, building, draining, fencing, sub-

soiling, and so forth; the landlords, with rare exceptions, did nothing. Accordingly, in almost all cases of eviction, the tenants had to leave behind them the results of the labour of a life, which formed the best part of their capital. There was much resistance, but it was in most cases in the shape of secret outrage. Thus the bitter land war went on; and for ten years or so after the

WILLIAM SMITH O'BRIEN.
*(From a miniature, by permission of D. O'Brien, Esq.)*

famine Ireland was one of the most perturbed and most miserable countries on the face of the earth.

Encumbered Estates Act.

A large proportion of the landlords as well as of the tenants had been ruined by the famine, and their estates were heavily mortgaged. To relieve these by enabling them to dispose of their property, the Government, in 1849, instituted a court in Dublin to facilitate the sale of encumbered estates. The Act was purely in the interest of the landlords, and no thought was taken of the tenants. The purchasers bought the estates as they stood, including the tenants' permanent improvements, which were all confiscated by becoming the property of the new landlords. In 1850 a Land League was formed in Ireland with the

object of forcing the Government to pass some measure of relief; and several Bills were introduced from time to time, which came to nothing. In 1860 the Government passed a Bill by which all improvements made by the tenant were secured to him, provided they had been made with the consent of the landlord; but the landlords never gave consent, and this Bill turned out quite ineffective. Meantime it soon appeared that under the operations of the Encumbered Estates Act the state of the country became worse than before. The new proprietors were generally men who had purchased as a speculation—merely to make money—having no knowledge of the tenantry and no sympathy with them. Rents were very generally raised; there was a resurgence of evictions, resistance, outrages, and emigration; and the peasantry continued to disappear from the face of the country.

*Photo: W. Lawrence, Dublin.*

T. F. MEAGHER.

## *AUTHORITIES.*—1846–1865.

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Sir Spencer Walpole, *History of England from* 1815 and *History of Twenty-five Years* (from 1856); Justin McCarthy, *History of Our Own Times;* H. W. Paul, *History of Modern England* (1904); Fyffe, *Modern Europe;* A. Debidour, *Histoire Diplomatique de l'Europe;* Kinglake, *History of the Russian War;* Histories of the Indian Mutiny by Malleson and Holmes; Bosworth Smith, *Life of Lord Lawrence;* Sir T. Martin, *Life of the Prince Consort;* Dalling and Ashley, *Life of Palmerston;* Sir Spencer Walpole, *Life of Lord John Russell;* Sir A. Gordon, *Life of Lord Aberdeen;* Morley, *Life of Cobden,* Greville, *Journals;* Count Vitzthum, *St. Petersburg and London;* Lord Malmesbury, *Memoirs of an Ex-Minister;* Ashwell and Wilberforce, *Life of Samuel Wilberforce;* Davidson and Benham, *Life of Archbishop Tait;* Hodder, *Life of Lord Shaftesbury;* *Letters* of Lord Blachford; Sir A. Taylor, *Autobiography;* Sir Wemyss Reid, *Life of Lord Houghton;* Count Beust, *Memoirs;* Bianchi, *La Politique du Comte Camille de Cavour.*

### SPECIAL SUBJECTS.

*The Army, The Navy, The Church.*—*See* chap. xxiv. *Literature,*—*See* chap. xxi.

*Art,* 1846–1885.—There is no complete, competent, and comprehensive history of art as it existed in England during the period in question. The nearest approach to a work of the sort, which, nevertheless, does not cover all the ground, is S. and R. Redgrave's *Century of Painters,* while some of C. R. Leslie's Essays, being pregnant of knowledge, thought, and fine taste, are invaluable as regards the principles and technique of art. The criticisms published in the *Builder,* the *Athenæum,* and several similar journals are the most trustworthy. To these may be added many excellent papers by P. G. Hamerton and others in the *Portfolio.* Among the numerous recent biographies of artists may be mentioned Hamerton's and Thornbury's *Lives* of Turner; O'Driscoll's *Maclise;* C. R. Leslie's *Autobiographical Recollections;* Gilchrist, *Etty* and *Blake;* F. G. Stephens, *Landseer* and *Mulready;* Armstrong, *Sir Frederic Leighton, Briton Rivière,* and *Sir John Millais;* Layland, *Charles Keene;* the various biographies of Dante Gabriel Rossetti, by W. M. Rossetti, J. Knight, Hall Caine, J. Sharp, and F. G. Stephens; Story, *John Varley* and *John Linnell;* *G. E. Street,* by the architect's son; H. Palmer, *S. Palmer* and *Joseph Wolf;* Dr. Solly, *David Cox* and *W. Müller;* and the *Autobiographies* of Messrs. Cope, S. Cooper, Frith, and Haydon. Works on Art, as such, are not reckoned here.

*Philosophy.*—Besides the works of the writers referred to, the *Histories of Philosophy* of Ueberweg and Erdmann, the *Dictionary of National Biography,* the *Encyclopædia Britannica,* and obituary notices in *Mind,* may be consulted for dates and bibliographical details.

*Biology.*—*Life and Letters of Charles Darwin,* edited by his son, Francis Darwin; 3 vols. (London, 1887). Of the mass of Darwinian literature, S. Butler, *Evolution Old and New* (1879); Romanes, *Darwin and after Darwin; Charles Darwin: Memorial Notices,* by Huxley and others ("Nature Series," 1882); E. B. Poulton, *Charles Darwin and the Theory of Natural Selection;* Clodd, *Pioneers of Evolution;* Grant Allen, *Charles Darwin* (1885), are more or less historical.

*The Mercantile Marine.*—Morley Roberts, papers on *The Great Steamship Lines* in "Murray's Magazine," IX. (London, 1890); Fry, *North Atlantic Steam Navigation; P. and O. Pocketbook.*

*Agriculture,* 1846–1885.—Rham, *Dictionary of the Farm,* 1850; Caird, *English*

*Agriculture*, 1852; Norton, *Cyclopædia of Agriculture*, 1875; Ramsay, *History of the Highland and Agricultural Society of Scotland*, 1879; Caird, *Landed Interest*, 1880; Sheldon, *Dairy Farming; The Rothamsted Experiments*, 1895; *Journal of the Royal Agricultural Society*, 1846–85; *Journal of the British Dairy Farmers' Association*, 1877–85; *Journal of the London Farmers' Club*, 1877–85; *The Annual Statement of Trade*, 1855–85; *The Statistical Abstract*, United Kingdom, 1854–85; *The Veterinary Report*, 1875–85; *The Agricultural Returns*, 1877–85.

*Medicine and Economic History.*—*See* chap. xxi. *Social Life, etc.*—*See* chap. xxii.

*Scotland*, 1815–1885.—*General and Political:* Cockburn, *Memorials of his Time* (1856); *Journal* (ends 1859); *Lives* of Jeffrey (1852), Adam Black (1885), and Duncan Maclaren, M.P. *The Church Question.*—Buchanan, *Ten Years' Conflict* (1849); Hanna, *Life of Chalmers* (1849–52); Bayne, *Life and Letters of Hugh Miller* (1871); Story, *Life of Story of Rosneath* (1862) and of *Rev. Dr. Lee* (1870); Macleod, *Memoirs of Norman Macleod;* Mrs. Oliphant, *Life of Principal Tulloch. Social and Economic Condition.*—Dr. Chalmers, *Christian and Civic Economy of Large Towns* (1821); *New Statistical Account of Scotland* (15 vols., 1845); Alison, *Management of the Poor* (1840); Fraser, *Life of David Stow* (1868); Miller, *Schools and Schoolmasters* (1855); Guthrie, *Plea for Ragged Schools* (1847); *Report of Relief Board on the Hebrides* (1849); Lamond, *Poor Law* (1891); Cockburn, *Circuit Journeys;* Peter Mackenzie, *Reminiscences* (1865). *Industry.*—Bremner, *Manufactures of the West of Scotland* (1876); Bruce, *Life of William Denny (Marine Engineer) One Hundred Glasgow Men;* Deas, *The Clyde* (1873); Miller, *The Clyde from Source to Sea; Report of the Crofter Commission* (1884); Duke of Argyll, *Crofts and Farms in the Hebrides* (1883); *Scotland as it Was and Is* (1887); Acworth, *Railways of Scotland* (1890). *Manners and Incident.*—*Autobiography of Mrs. Fletcher* (1770–1855; Norton, *Early Letters of Carlyle; Lives* of Dr. Thomas Guthrie (begins 1863) (1874), and Sir Robert Christison, M.D. (1794–1874); Mrs. Oliphant, *Edward Irving* (1862); Mrs. Gordon, *Christopher North* (1862); Smiles, *Nasmyth;* E. Hodder, *Sir George Burns* (1890).

*Ireland.*—*See* chap. xxiv.

*Photo: W. Lawrence, Dublin.*

THE HON. SIR CHARLES GAVAN DUFFY, K.C.M.G.

# CHAPTER XXIV.

## THE SUCCESSION OF THE DEMOCRACY. 1865–1885.

LLOYD C. SANDERS. Political History. The Second Russell Ministry.

On the death of Lord Palmerston, Earl Russell inevitably became Prime Minister. Just as inevitably he forced upon the Cabinet a Reform Bill that many of its members disliked. It reduced the borough franchise from £10 to £7, the county franchise from £50 to £14, and gave lodgers the vote. The moderate Liberals promptly took alarm, and under the leadership of Lord Grosvenor[1] and Mr. Robert Lowe,[2] formed what Mr. Bright called a new "Cave of Adullam." After carrying the second reading by a majority of five, Ministers, on June 18th, 1866, were beaten on Lord Dunkellin's amendment substituting rating for rental as the basis of the borough franchise. They resigned; and thus Lord Russell's long official career came to an end.

The Third Derby Ministry.

Once more Lord Derby was called upon to form a Ministry with a minority behind it. Mr. Disraeli was, of course, his Chancellor of the Exchequer; Lord Stanley[3] went to the Foreign office; Lord Carnarvon to the Colonial; and Lord Cranborne[4] became Secretary for India. The leader of the House of Commons saw clearly enough that a measure of Reform could not be avoided. The Radicals were agitating, and before the Government had been many weeks in office the disorderly contingent of a public meeting had pushed down the railings of Hyde Park. Mr. Disraeli next year at first attempted to proceed by way of resolution, but his tactics were vigorously resisted by the Opposition; and a series of resolutions, proposed by him and explained in debate as foreshadowing the introduction of a £6 franchise Bill, had eventually to be withdrawn, February 25th, 1867. A larger measure of Reform was then submitted to, and adopted by, the Cabinet, with the exception of Lords Carnarvon and Cranborne and General Peel, who retired from the Government.

[1] Afterwards Duke of Westminster.
[2] Afterwards Viscount Sherbrooke.
[3] The next Earl of Derby.
[4] Afterwards Marquis of Salisbury.

Their resignation led to a hastily concocted compromise, known through the subsequent indiscretion of Sir John Pakington as the "Ten Minutes Bill," which, however, was never introduced into Parliament. There was nothing for it but to introduce a Household Suffrage Bill, which, after long and bitter debate, was carried. In the following year (1868) the Irish and Scotch Reform Acts supplemented the English measure. In their final shape these Acts bestowed the franchise on all male householders paying poor-rate in English and Scotch boroughs; in Ireland there was a rating limit of £4. In the counties votes were given to occupiers of £10 in England, and £14 in Scotland. Eleven boroughs were disfranchised, and thirty-five lost a member. These seats were partly presented to Lancashire and Yorkshire. Two new London constituencies, Chelsea and Hackney, received two members; Leeds, Liverpool, Manchester, Birmingham, and Glasgow, had a third member; Salford, Merthyr, and Dundee, a second: ten new boroughs, London University and the Scotch Universities, in pairs, one member. By a rather artificial contrivance, the minorities were given a chance in large boroughs and in some counties, through a provision (abolished in 1885) by which an elector could vote for only two candidates where there were three seats.

The Second Reform Bill.

The Liberal party was in want of a cry; it was supplied them by an Irish revolutionary organisation known as the Fenians. Their conspiracy had been suppressed by the Russell Ministry through the timely arrests of Stephens, a "head centre," and O'Donovan Rossa, and the suspension of the Habeas Corpus Act. They effected, however, isolated risings and outrages, such as a ludicrous invasion of Canada by a disorganised rabble in 1866, and, in the following year, a plot (which came to nothing) for an attack on Chester Castle, the rescue of two Fenian prisoners and murder of Police-sergeant Brett at Manchester, and, finally, the destruction of the wall of Clerkenwell Prison.

The Fenians.

The last two crimes, as Mr. Gladstone afterwards explained, brought the disestablishment of the Irish Church "within the region of practical politics." In April, 1868, he carried against the Government the first of a series of resolutions in favour of that change, and followed it up with a Suspensory Bill, which the House of Lords rejected. Mr. Disraeli,

The Irish Church Resolutions.

THEY 'RE SAVED! THEY 'RE SAVED!

(See "Essence," p. 155).

"DROPPING THE SAFEGUARDS" IN THE REFORM BILL OF 1867.

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become Prime Minister through Lord Derby's retirement, refused to recommend a dissolution until he had carried his Irish and Scotch Reform Bills. The reckoning came in November, 1868, and the Liberals found themselves with a majority of 120.

Canada.

Before his resignation, Lord Carnarvon, with the able assistance of the Canadian statesman, Sir John Macdonald, had laid the foundations of a united Canada. His Enabling Act placed the Dominion under a Governor-General appointed by the Crown, with a Cabinet responsible to Parliament, of which the House of Commons was elected by a low suffrage, while the Senate consisted of life members. The provinces retained their local legislatures and executives. The Union was promptly joined by Ontario, Quebec, Nova Scotia, and New Brunswick, and by 1872 it was completed by the accession of Manitoba, British Columbia, and Prince Edward's Island. The

Abyssinia.

Abyssinian War was forced upon the country by King Theodore, who refused to set free some British prisoners. Sir Robert Napier (Lord Napier of Magdala), with 12,000 English and Indian troops, thrust his way through a most difficult country, took Magdala, and drove Theodore to suicide. At the Foreign Office Lord Stanley had kept England neutral during the war between Prussia and Austria, and at its close he averted a serious crisis by arranging the neutrality of Luxemburg.

The First Gladstone Ministry.

Mr. Gladstone formed a Ministry extremely strong in ability, though composed of inharmonious elements. Mr. Lowe became Chancellor of the Exchequer; Lord Clarendon, Foreign Secretary; Mr. Cardwell, Secretary for War; the Duke of Argyll, Secretary for India; Mr. Childers, First Lord of the Admiralty. Radicalism was represented by Mr. Bright, as President of the Board of Trade; and Mr. W. E. Forster, as Vice-President of the Council. Even the staunchest friends of

Disestablishment of the Irish Church.

the Irish Church perceived it to be doomed. It represented the faith of a minority alien in origin, and it had put off reform until too late. Mr. Gladstone carried his Bill through the Commons by huge majorities. In the Lords, Bishop Magee made a name for himself among Parliamentary orators in defence of a cause that he knew to be lost. The second reading was passed, but the measure was wholly transformed by amendment after amendment. These the Government declined

to accept, and a deadlock seemed imminent. Diplomacy and good sense, however, effected a compromise at the last moment possible. The Irish Church received, in the end, quite adequate terms. It was disestablished, its courts abolished, and its bishops deprived of their seats in the House of Lords. But churches, cathedrals, and parsonages were transferred to the Church of Ireland as a corporation, together with all private

THE LEAP IN THE DARK, AUGUST, 1867.
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endowments subsequent to 1660. Altogether the Church received a sum of over ten millions sterling. The clergy obtained full compensation for their life interests, while the surplus was set aside for objects that were not sufficiently defined to be really useful.

**The Irish Land Act.**

With undiminished vigour Mr. Gladstone proceeded, in 1870, to reform the Irish Land Laws. The Government had the reports of numerous Commissions to guide it, while Ministry after Ministry had made half-hearted efforts to readjust the balance between landlord and tenant. It was confronted by an excess of competition which forced rents up to extravagant prices. Contrary

to the English practice, the tenant, and not the landlord, put up farm buildings and made improvements. The stories of rack-renting and evicting landlords were proved to be flagrantly exaggerated; some of that class, however, used their powers harshly. In the North, the Ulster custom "permitted" the sale of the goodwill of a farm by the outgoing to an incoming tenant, but it was not recognised by law. The Act, with the accompanying Peace Preservation Act, gave peace to Ireland for some six or seven years. The chief innovations were compensation for "disturbance" and for improvements. Ejectment for non-payment of rent was not reckoned as a disturbance except where the annual charge was under £15, and the court certified that it was exorbitant. Improvements, other than permanent buildings and reclamation made twenty years before claim, did not entitle to compensation. The Ulster tenant-right was legalised, and some purchase clauses authorised the advance of money by the Board of Works for facilitating sales. They proved, however, for the most part inoperative.

The Education Act.

In that same session Mr. Forster placed elementary education on a national basis. In the previous year his Endowed Schools Act freed the grammar schools from obsolete conditions, in spite of the clamour raised by vested interests. His Elementary Education Bill met with still more bitter opposition from the Birmingham League, which would be satisfied with nothing less than secular schools under local control. Mr. Forster, however, declined to meddle with the Voluntary schools where they supplied the needs of a district. Where they failed, the ratepayers and burgesses were empowered to start elected school boards, levy a rate, and enforce the attendance of children. After fierce wrangles a conscience-clause was inserted at the instance of Mr. Cowper-Temple by which the Bible should be taught in Board Schools, but no distinctive catechism or religious formularies. The age for compulsory attendance was to be from five to thirteen.

Army Reform.

Mr. Cardwell's turn, as Secretary for War, came in 1871. In the course of two years he succeeded in abolishing the purchase of military commissions, in introducing the short-service system of enlistment, in creating territorial regiments, and placing the militia and volunteers directly under the generals commanding districts (p. 557). The abolition of purchase, however, was not

effected without a prodigious amount of turmoil. Fiercely resisted in the Commons, it seemed likely to succumb before the hostility of the House of Lords. Mr. Gladstone thereupon took the unusual course of employing a royal warrant to effect the change.

The Ballot Act and the Licensing Bill.

By this time the Gladstone Government had about outstayed its welcome. Mr. Lowe's budgets were too pedantic to be popular; some of the subordinate Ministers, notably Mr. Ayrton, the First Commissioner of Works, covered themselves with ridicule. An appointment or two raised much unnecessary scandal. But the chief mistake of the Ministry consisted in an excess of reforming zeal. Mr. Bruce's[1] Licensing Bill of 1872 was furiously opposed by the liquor trade, though it merely placed some trifling restrictions on the sale of intoxicants. Again, the Ballot Bill was nearly wrecked in the Commons by Mr. Vernon (afterwards Sir William) Harcourt and by Mr. Leatham, and was freely amended in the Lords. A quarrel between the two Houses seemed imminent after the Duke of Richmond had carried a clause making secret voting optional, but in the end it was withdrawn.

Foreign Affairs.

Lord Granville's management of foreign affairs after the death of Lord Clarendon could hardly be set down to the credit side of the account. The war between France and Germany took him completely by surprise, but he caused it to be understood that any attempt to violate Belgian neutrality would bring England into the field. His attitude was not equally dignified when Prince Gortschakoff seized the opportunity of a general embroilment to repudiate the provision of the Treaty of Paris which closed the Black Sea to ships of war. The Foreign Secretary launched an empty protest, and, in March, 1871, summoned a conference in London, which simply registered Russia's high-handed action. The award of the Geneva Tribunal, which was pronounced in the following year, turned also to the disrepute of the Ministry. Little allowance was made for the circumstance that the envoys who arranged the Treaty of Washington (May, 1871), whereby the United States agreed to submit their claims to arbitration, had been despatched not by Lord Granville but by his predecessor, Lord Stanley. Again, the ruling-out of the monstrous indirect claims did the Government little good. The decision that Great Britain

The Black Sea Question.

The "Alabama" Claims.

[1] Mr. Bruce was afterwards created Lord Aberdare.]

was to pay 15,000,000 dollars for failing to stop some Confederate cruisers was generally regarded as in excess of the offence.

The Irish University Bill, 1873.

Mr. Gladstone produced his ill-fated Irish University Bill early in the session of 1873 (p. 882). Its purport was to set up an unsectarian university and to deprive Trinity College of much of its usefulness. Repudiated both by Irish Catholic members and independent Radicals like Mr. Fawcett, it suffered defeat on the second reading by three votes (287 to 284). Mr. Gladstone resigned, but Mr. Disraeli declined to form a Ministry, as he had "no matured policy to present to the country." Mr. Gladstone thereupon resumed the thankless task, and, to a certain extent, strengthened the Ministry by rearranging it.

The Judicature Act.

The Lord Chancellor (Lord Selborne) carried out the judicial reforms advocated by Lord Cairns, through an Act which united the courts of law into a High Court of Justice, while retaining the House of Lords as a Court of Appeal, and harmonised the procedure of common law and equity (p. 546 *seqq.*). Despite this excellent innovation, and Mr. Fawcett's Act abolishing religious tests in Dublin University, the constituencies, whenever they had a chance, returned a Conservative. On February 5th, 1874, Mr. Gladstone abruptly announced the dissolution of Parliament, with a promise to abolish the income-tax. He was rewarded by a Conservative majority of fifty.

India.

Lord Mayo's death at the hands of a native convict brought his great Viceroyalty of India to an end in February, 1872. He had decentralised finance, and given much impetus to public works. His successor, Lord Northbrook, had to contend with a famine in Lower Bengal, and proved quite equal to the emergency, though a worse visitation awaited the empire in 1876 and 1877. The trial of the Gaikwar of Baroda for an attempt to poison the British Resident ended in an unsatisfactory acquittal, but the Government felt justified in

Ashanti.

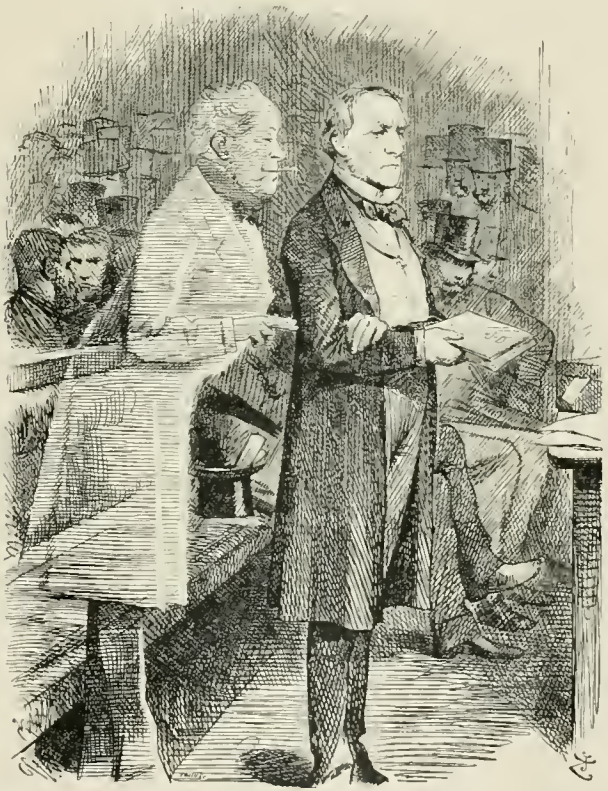
deposing him. A war with King Coffee Calcalli, of Ashanti, necessitated by his constant raids into the Gold Coast Colony, resulted in the capture of Coomassie by Sir Garnet Wolseley, and a hastily concluded treaty of peace.

Mr. Disraeli, having attained his own at last, formed a Ministry of experienced men of affairs. Lord Cairns was Lord

1885]

Chancellor; Sir S. Northcote, Chancellor of the Exchequer; Lord Derby (formerly Lord Stanley), Foreign Secretary Lord Salisbury (Lord Cranborne, p. 519), Secretary for India. Lord Carnarvon went to the Colonial Office again; Mr. Gathorne

The Disraeli Ministry.



THE INJUDICIOUS BOTTLE HOLDER, BY SIR JOHN TENNIEL.

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Hardy (afterwards Lord Cranbrook) became Secretary for War; and Mr. R. A. (afterwards Lord) Cross, Home Secretary.

The beginnings of the new Government were modest enough. Much of the session was spent in amending its predecessor's Acts. A Scottish Church Patronage Act removed some of the anomalies of lay patronage, but did not heal the breach of thirty years. The Public Worship Regulation

The Public Worship Act.

Bill, on the other hand, engendered much Parliamentary heat. Introduced as a disciplinary measure by the Archbishop of York, both Lord Shaftesbury and Lord Salisbury received it with unconcealed dislike. Interpreted by Mr. Disraeli as a device for "putting down Ritualism," it irritated the High Churchmanship of Mr. Gladstone, but filled Sir William Harcourt with a Protestant zeal not altogether according to knowledge. The Act was a failure; it merely made martyrdom the reward of eccentricity, and alienated the High Church party (p. 592).

Domestic Legislation.

Early in 1875 Mr. Gladstone abruptly resigned the leadership of the Opposition, that step being dictated "by his personal views as to the best method of passing the closing years of his life." Lord Hartington undertook the dreary duty, and the Government had matters pretty much its own way in Parliament. It passed several useful and unpretentious measures in the course of the next four sessions. Among them were the Agricultural Holdings Act, which made the presumption of law in favour of the tenant; the Merchant Shipping Act, which the energy of Mr. Plimsoll forced on the Ministry; Sir S. Northcote's Friendly Societies Act; and a number of social reforms for which Mr. Cross, a highly efficient Home Secretary, was responsible. They included a Public Health Act, a Labourers' Dwellings Act, and a Factory and Workshops Act. The Universities Act of 1877 was an important piece of legislation, which made provision for University purposes, especially the encouragement of natural science, out of college revenues, through the suppression of "idle Fellowships" (p. 850). The most controversial measure of those years was the Royal Titles Act, permitting the queen to assume the title of Empress of India. It brought up Mr. Lowe in his most bitter mood, but Mr. Disraeli held the advantage.

The Eastern Question.

Foreign politics, in 1875 and onwards, thrust home affairs into the background. The purchase of the Suez Canal shares from the embarrassed Khedive Ismail, though much criticised at the time, proved a most profitable investment. But the general condition of the Turkish Empire was more critical than the finances of the vassal State. The repudiation of half the national debt and the revolt of Herzegovina and Bosnia brought matters to a head. The Sultan, Abdul Aziz, disregarded the Andrassy Note, which had been signed by the Powers, until an outbreak at

Salonica caused the British, French, and German Governments to move their fleets into Turkish waters, and the reforming party, headed by Midhat Pasha, deposed him. Next year (May, 1876) came the Berlin Memorandum, to which Lord Derby declined to be a party, because it implied the right of the Powers to enforce reforms by armed intervention. The rebellion in Herzegovina and Bosnia smouldered on; Servia and Montenegro declared

*Photo: Walker & Cockerell.*

SIR STAFFORD HENRY NORTHCOTE, FIRST EARL OF IDDESLEIGH, BY EDWIN LONG, R.A.

(*National Portrait Gallery.*)

war on Turkey; a movement in Bulgaria was repressed with hideous cruelty by the Turkish irregulars. When the news of the Bulgarian atrocities became known, an agitation swept the country from end to end, and drew Mr. Gladstone from his brief semi-retirement. A Conference met at Constantinople, with Lord Salisbury as our first Plenipotentiary, but, encouraged by some victories over the Servians, the new Sultan, Abdul Hamid, doggedly rejected its terms. In April, 1877, when a Protocol signed by the Powers seemed to have smoothed most difficulties

The Russo-Turkish War.

away, the Russian armies suddenly crossed the Turkish frontier, and carried everything before them, despite the heroic defence of Plevna by Osman Pasha. By the end of the year the way to Constantinople lay open to the Czar's troops. Lord Beaconsfield, however, declared at Guildhall that England was ready, if need were, for a second or third campaign. He sent the fleet to the Dardanelles, asked for a vote of credit of six millions, called out the reserves, and despatched Indian troops to Malta. Lord Carnarvon and Lord Derby resigned, and the latter was replaced by Lord Salisbury.

The Berlin Congress

The Czar Alexander halted his forces, and concluded the Treaty of San Stefano with the Porte. The British Government insisted on its modification, declaring, in particular, that a "big Bulgaria," extending from the Danube to the Ægean, was inadmissible. After a period of extreme tension, Russia gave way, and the Congress of Berlin met in June, 1878, with Lord Beaconsfield, Lord Salisbury, and Lord Odo Russell as the British Plenipotentiaries. An agreement[1] had already been effected on the main points under dispute by Lord Salisbury and Count Schouvaloff. While the Congress was at work a separate Convention was arranged between England and Turkey, under which the former occupied Cyprus and promised to defend the Turkish dominions in Asia against attack, while the Sultan gave the familiar undertakings about reform. By the Treaty of Berlin the "big Bulgaria" was divided into two, the part north of the Balkans becoming an independent though tributary State, while the southern portion remained Turkish, with a Christian Governor and administrative home-rule.[2] Montenegro, Servia, and Roumania were declared independent, but the last was forced to exchange Bessarabia for the Dobrudscha with Russia. That Power obtained large acquisitions of territory in Asia, including Kars and Batoum, which was to remain a free port. Austria occupied Bosnia and Herzegovina: to Greece there was doled out a prospective rectification of frontier. The Sultan cheerily

[1] The publication of this in the *Globe* (June 14th), through a breach of confidence by a journalist temporarily employed at the Foreign Office, caused much excitement at the time.]

[2] The two were united in 1885. The part popularly known as Macedonia was given back to the Turks. A reformed scheme of administration was devised for it under the authority of the Powers, but was never put into effect.]

expressed his readiness to redress the grievances of his Christian subjects in Crete and Armenia.

Lord Beaconsfield returned home bringing, to use his own

"A BLAZE OF TRIUMPH"—THE CYPRUS CONVENTION, 1878.
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words, "peace with honour," but Russia revenged herself by intriguing with Afghanistan, and the Ameer Shere Ali readily received a Russian mission. The Viceroy of India, Lord Lytton, had already causes of complaint against the Ameer, who temporised with the proposal that he should discuss his grievances with a British envoy. At last Shere Ali brought matters to a crisis by turning back Sir Neville Chamberlain's mission on the

**The Afghan War.**

frontier. War was declared on November 21st, 1878, after Lord Beaconsfield had improved the occasion at the Mansion House by asserting that one of its objects was the acquisition of a "scientific frontier." The ill-armed Afghan levies made a poor resistance to the British forces; Shere Ali fled into Russian territory and died there; his son and successor, Yakoub Khan, signed the Treaty of Gandamak, and received a subsidy from the Indian Government. The British mission under Sir Louis Cavagnari had only been established some six weeks at Cabul, however, when it was massacred (September 3rd, 1879) by the fanatical populace. The war began again, and this time there was a stiff fight at Charasiab before General Roberts occupied Cabul. Forced to retire to Sherpur, he held his own with difficulty against the tribesmen, until relieved by Sir Donald Stewart advancing from Candahar. An acceptable candidate, Abdur Rahman, a nephew of Shere Ali, presented himself and was installed Ameer. General [afterwards Earl] Roberts promptly set forth on his famous march to Candahar, and retrieved the crushing defeat of Maiwand which had been inflicted on General Burrows by Ayoub Khan. The Liberal Government directed the new Viceroy, Lord Ripon, to evacuate Candahar, and the Afghans were left to the congenial occupation of settling the succession by civil warfare.

The Zulu War.

In South Africa Lord Carnarvon had failed to set up a confederation, owing to the jealousies of the various States. The annexation of the Transvaal, undertaken with the object of protecting the Dutch population from the Zulus, precipitated a war with their king, Cetewayo. British arms were discredited by the defeat of Isandhlwana; but the heroic defence of Rorke's Drift saved Natal, and Cetewayo's military organisation was finally shattered at Ulundi.

Home Rule and the Land League: Parnell.

In England commercial depression and bad harvests were responsible for not a little discontent towards the close of the Beaconsfield Ministry. In Ireland an agitation, half Parliamentary, half Fenian, had stirred up agrarian war. Irish politics had moved apace since the general election. The control of the Home Rule party, a creation of 1870, slipped from the inert hands of Mr. Isaac Butt seven years later. His place was taken by Mr. Parnell, a man of iron will and unscrupulous tactics, who, in conjunction with Mr. Biggar and a desperate band, deter-

mined to render legislation impossible through relentless obstruction. Sir Stafford Northcote's gentle persuasiveness was at a loss how to meet them, and they brought no small confusion on the Government. The Irish Executive was equally powerless when, in October, 1879, the Land League was started by Mr. Michael Davitt with the avowed object of exterminating "landlordism." Funds came from America; home-grown oratory never failed, and outrages followed on the track of that oratory. The Government did its best to meet the destitution of the peasantry by introducing a Relief of Distress Bill early in the session of 1880. But "a danger, in its ultimate results hardly less disastrous than pestilence or famine," formed the topic of Lord Beaconsfield's letter to the Duke of Marlborough, the Lord Lieutenant, which he published as a political manifesto shortly after the dissolution had been anounced in March.

**The Election of 1880.**

Mr. Gladstone, fresh from one Midlothian campaign, started, inexhaustible, on a second. His fiery denunciations of the Government's misdeeds hit the popular humour, and, except in London and constituencies bordering on great cities, the revulsion was marked. The election gave the Liberals a majority of nearly fifty over Conservatives and Home Rulers combined. Mr. Gladstone, in accordance with the unanimous desire of the party, became Prime Minister and Chancellor of the Exchequer as well. Of his former colleagues Lord Granville and Lord Selborne were once more Foreign Secretary and Lord Chancellor. Lord Hartington went to the India Office, Lord Kimberley to the Colonial, Mr. Childers to the War Office, and Lord Northbrook to the Admiralty. Sir William Harcourt became Home Secretary, and Mr. Forster undertook the anxious duties of Irish Secretary. Of the old Radicals Mr. Bright was Chancellor of the Duchy of Lancaster; of the new, Mr. Chamberlain entered the Cabinet as President of the Board of Trade, while Sir Charles Dilke was Under-Secretary for Foreign Affairs.

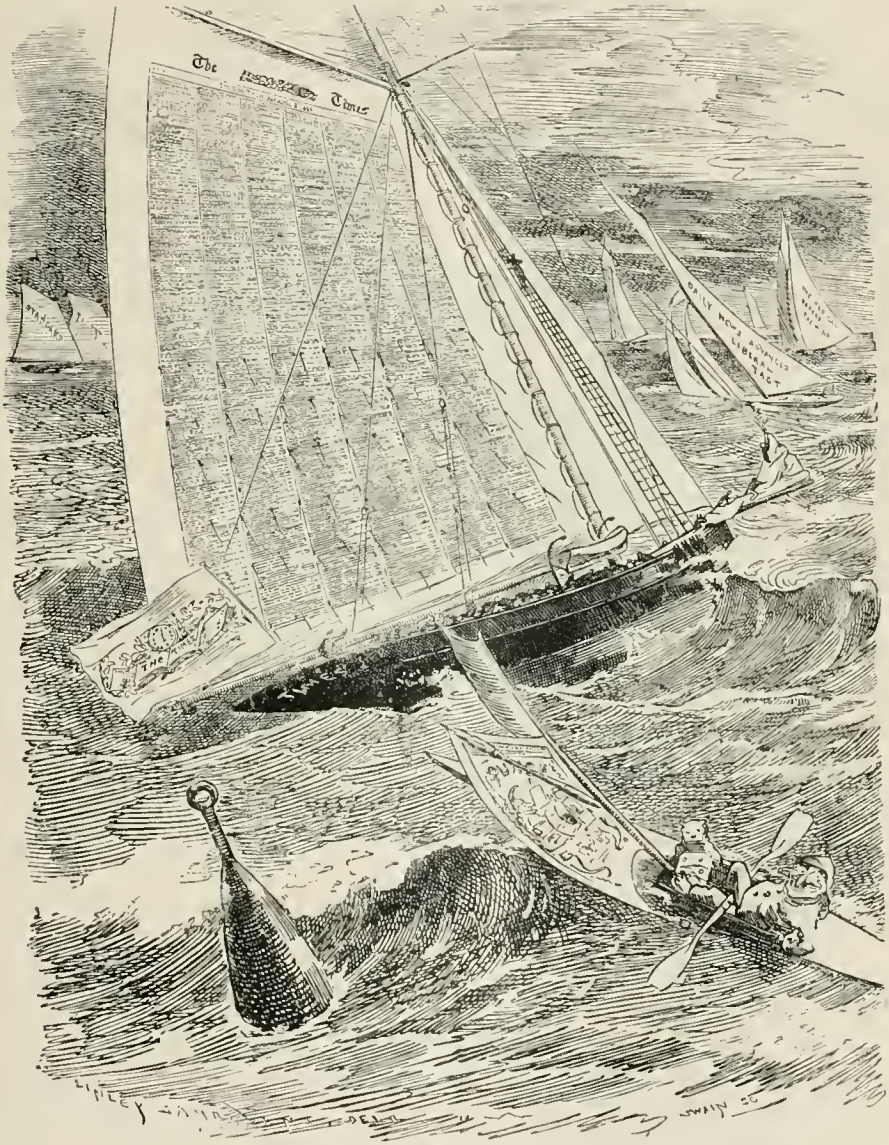
**The Second Gladstone Ministry.**

**English Affairs.**

The Government was much embarrassed by the claim of Mr. Bradlaugh, an avowed Atheist, who had been returned for Northampton, to make an affirmation instead of taking the oath; and the question, after causing disorderly scenes, remained unsettled. Otherwise Ministers did fairly well during the short session by settling the Burials difficulty, and passing an Employers' Liability Bill and a Ground Game Bill. Mr. Forster's

Ireland. Compensation for Disturbance Bill, however, was rejected by the House of Lords by an overwhelming majority, because it covered the obnoxious cases of evictions for non-payment of rent. A most disturbed autumn and winter followed in Ireland. Lord Mountmorres, an Irish landlord, was foully murdered; while Mr. Parnell's advice, that the man who offended against the Land Boycotting. League should be shunned "as if he were a leper of old," was crystallised into a system of which Captain Boycott stood for the unwilling godfather. The failure of the prosecution of Mr. Parnell and his fellow-agitators early in the following year rendered the Executive almost impotent.

The Policy of Ministers. Mr. Gladstone prepared to deal with Irish disaffection by what Lord Randolph Churchill, then a brilliant Conservative irregular, called a "mixture of kicks and caresses." Early in the session of 1881 Mr. Forster introduced a stringent Protection of Persons and Property Bill, which the Home Rulers fought line by line and word by word. Sir William Harcourt followed with an Arms Bill. Lord Beaconsfield lived just long enough to see this emphatic fulfilment of his prophecy. He died on The Irish Land Act. April 19th, and on the 7th of that month Mr. Gladstone had introduced his second Irish Land Bill. This measure, which took up the whole of the session, and which the House of Lords did not allow to pass without considerable amendment, virtually established as principles the "three F's"—fair rent, free sale, and fixity of tenure. A Land Commission, with sub-commissions forming courts, was established to fix a "judicial rent," which was to remain unchanged for fifteen years, after which it could be revised. During that period the tenant could not be evicted except for non-payment of rent, excessive waste, sub-letting, or certain other specified acts. If evicted the tenant could still sell his interest, and he could claim compensation for improvements. A statutory term could also be created by mutual agreement between landlord and tenant. Future tenants—that is, those taking up their holdings after the passing of the Act—only came under it indirectly, in the event of the landlord raising the rent. The Land Commission was empowered to advance money to tenants for the purchase of their farms to the amount of three-fourths of their value. Contemptuously received by Mr. Parnell, the Act was far from bringing peace immediately to Ireland. On the




THE *TIMES* TACKING: "READY ABOUT," 1880.

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contrary, so inflammatory were his speeches that in October Mr. Gladstone, having denounced him and his followers at Leeds as "preachers of the gospel of public plunder," had them consigned to Kilmainham Gaol. The Land League thereupon issued a "No-Rent Manifesto," and was suppressed as an illegal and criminal association. Agrarian outrages increased, however,

Parnell in Gaol.

LORD FREDERICK CAVENDISH, AFTER GEORGE RICHMOND, R.A.

*(By permission, from a print by Messrs. Graves, in the possession of his Grace the Duke of Devonshire.)*

and the agitation, though worked in secret, showed no signs of abatement.

The Boer War.

The annexation of the Transvaal was most unpopular with the Boers, who sent a deputation to England with a demand for the restoration of local independence. This refused, rebellion rapidly gathered head (p. 571). A Provisional Government was formed in December, 1880, and the British garrisons that did not surrender were closely besieged. Hastening up to their relief Sir George Colley suffered two reverses, and on February 29th he met with defeat and death on Majuba Hill, whither he had climbed in the desperate hope

lodging the Boers from their position. Nevertheless, Mr. Gladstone, recoiling from "blood-guiltiness," directed Sir Evelyn Wood to conclude an armistice, and eventually a convention was arranged at Pretoria. Modified in London three years later, it gave the Boers full self-government, while retaining for the Crown a rather shadowy suzerainty. Majuba.

Ireland continued disturbed, and the Government, at the cost of Mr. Forster's resignation, determined on an abrupt change of policy. Mr. Parnell and the other Irish members were released on May 2nd, 1882, after an understanding had been effected which was popularly known as the Treaty of Kilmainham. Five days afterwards the new Chief Secretary, Lord Frederick Cavendish, and the Permanent Under-Secretary Mr. Burke, were murdered in Phœnix Park, Dublin, by a gang of conspirators calling themselves the Invincibles. Recourse was had to coercion again, and a stringent Prevention of Crimes Act passed, with an Arrears of Rent Act as a sedative. During the autumn session the Government carried some procedure resolutions to repress deliberate obstruction, and delegate business to Grand Committees. Irish loquacity was checked, but not Irish disorder, which found vent for a while in every kind of agrarian outrage, with an accompaniment of dynamite explosions in London. The Kilmainham Treaty.

The next two sessions were occupied in legislation for England. In 1883, the Government carried a Bankruptcy Act, an Agricultural Holdings Act, and a Corrupt Practices Act. In the following year it undertook once more the reform of the franchise. Mr. Gladstone's measure extended to the counties the same voting qualifications as the boroughs enjoyed, namely, household franchise, lodger franchise, a £10 annual value franchise, and the newly created service franchise. After much debating in the Commons, the Lords threw out the Bill, because it was unaccompanied by a scheme for the redistribution of seats. An agitation of some vehemence then took hold of the country, and there was talk about "mending" or "ending" the Lords. Shortly after the House had met for an autumn session, however, a compromise was effected by the two front benches. The Government produced its Redistribution Bill, and the Franchise Bill became law early in December. The companion measure disfranchised all boroughs with less than 15,000 inhabitants, and The Franchise Act, 1884.

deprived those with less than 50,000 of a member. The country was divided into single-member constituencies, with the exception of the City of London, reduced to two members, and the old boroughs containing a population between 50,000 and 165,000. England obtained eighteen additional members, Scotland twelve, while Ireland and Wales remained unaltered.

**Foreign Affairs: Egypt.**

Its foreign policy or want of policy proved, in the end, the Government's undoing. Prince Bismarck's colonial projects brought him into sharp collision with Lord Granville, rendered dilatory by advancing years. But Egypt and its Soudanese provinces gave cause for much graver anxieties (pp. 572, 573). The extravagance of the Khedive Ismail had brought about his deposition in 1879, and his son Tewfik had been set up under the Dual Control of France and England. The arrangement never worked smoothly, and in 1882 it collapsed before a native rising under Arabi Pasha. The French Republic declined all responsibility, and it fell to England to suppress Arabi by the bombardment of Alexandria in July, followed by Wolseley's victory at Tel-el-Kebir in September. Order had been barely restored, and Lord Dufferin had produced an ingenious scheme of reform, when news arrived that the Soudan was in rebellion under a religious leader known as the Mahdi. In November, 1883, his followers slaughtered an Egyptian army under Hicks Pasha, and a similar fate overtook Baker Pasha, advancing from Suakim. The rescue of the garrisons, more particularly of Khartoum, was clamorously demanded by the Opposition. In utter perplexity, the Government decided to send up General Gordon on a mission which proved impracticable. He made the startling request that the ex-slave-dealer Zebehr Pasha should come and help him govern, or that he should have troops with which to "smash" the Mahdi. Both ideas were rejected, and Gordon was left to shift for himself. At last popular indignation spurred the Government to action, and in August, 1884, Lord Wolseley was despatched to rescue Gordon. But he started too late: and, though a camel corps under Sir Herbert Stewart pushed across the desert, despite the desperate resistance of the Dervishes, it was all in vain. Sir Charles Wilson—for Sir Herbert Stewart had fallen at Metammeh—reached Khartoum in a steamer only to discover that the Dervishes had taken the town two days before (January 26th, 1885), and that Gordon had been

**The Soudan.**

**Gordon.**

1885]

butchered. Meanwhile Sir Gerald Graham's operations, with Suakim for their base, had resulted in much purposeless blood-

*Photo: Russell & Sons, Baker Street, W.*

CHARLES GEORGE GORDON.

*(From the statue by Onslow Ford, R.A., at Chatham.)*

shed. At first the Government was bent on the reconquest of the Soudan; then it wavered, and determined to retire on the Egyptian frontier.

As an additional trouble there came in March a collision between the Russians and Afghans, at Penj-deh. War between

England and Russia seemed inevitable. The Indian Government prepared to defend the frontier; Mr. Gladstone asked for a vote of credit of eleven millions. That luckless financier, Mr. Childers, was forced to produce a most disastrous Budget, and on one of his resolutions the Government found itself in a minority of 12 (264 to 252), and resigned. Penj-deh.

Lord Salisbury formed a Ministry, with Sir M. Hicks-Beach as Chancellor of the Exchequer and leader of the House, and Lord

THE TURN OF THE TIDE, 1885.

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R. Churchill as Secretary for India. Sir Stafford Northcote was somewhat ungraciously transferred to the Upper House[1] with the First Lordship of the Treasury. The Cabinet adhered to its predecessor's latest policy in Egypt, while all danger of a collision with Russia was removed by the appointment of a joint commission to determine the Afghan frontier. Before the session closed, the Lord Chancellor for Ireland, Lord Ashbourne, carried a meritorious Act for facilitating land purchase in Ireland. At the general election, however, which began in November, though the English boroughs showed a strong Conservative gain, the The First Salisbury Government.

[1 As Earl of Iddesleigh; he died not long afterwards.]

THE RIGHT HON. W. E. GLADSTONE, BY SIR J. E. MILLAIS, BART., P.R.A.
(*National Gallery.*)

counties went against the Government. The final result was: Liberals 335, Conservatives 249, Home Rulers, 86. Thus the Irish held the balance of parties—a result which Mr. Gladstone had in anticipation deprecated. But the events to which it immediately or ultimately led—the advent to power, in January, 1886, of a Liberal Ministry, the introduction of Mr. Gladstone's Home Rule Bill, and the consequent split in the Liberal party—open a new era in English political warfare which lies beyond the chronological limits assigned, for this among other reasons, to the present work.

F. C. MONTAGUE. Law Reform, 1800-1885.

In our legal history the nineteenth century is pre-eminently the period of direct legislation. The development of custom or of a traditional equity by judicial decision is at best a slow and irregular process, and it has its limits. A time comes when all the important deductions which can be drawn from an accepted principle have been exhausted. Further growth will then involve a transformation of the principle itself to which judicial authority is inadequate. The main outlines of our Common Law have been settled for some hundreds of years. The main outlines of Equity were settled before the end of the last century. The critical spirit of modern times necessarily restricts the latitude of interpretation enjoyed by judges. Yet the circumstances of our age have necessitated immense changes in the law. The writings of Bentham and his school and the example of foreign nations have called forth the desire for comprehensive and symmetrical legislation. The reformed Parliaments, at least before the recent unprecedented growth of loquacity, have been eager for work and fairly capable of doing business. Thus every year has produced a volume of statutes. Some of these statutes exceed in bulk the whole legislation of a medieval reign. It would be impossible in our limits to give even a curt analysis of one or two of these statutes, such as the Merchant Shipping Act of 1894, or the Conveyancing Act of 1881. We can only indicate the subjects with which legislation has been chiefly conversant, and the tendencies which legislation has displayed.

Growth of Statute Law.

A great part of our modern statutes has been concerned with what it is convenient to call public law. Not only has the governing authority in the State been remodelled by Reform Acts

and Acts for the Redistribution of Seats, but old departments of administration have been reorganised, new departments have been established, and the entire system of local government has been recast. Most of the enactments of this class, such as the New Poor Law (p. 300), the Municipal Corporations Acts (p. 157), the Public Health Acts (p. 267), and so forth, are touched upon in other chapters of the present volume. Here we need consider only those enactments which have altered the constitution of the courts of justice and the forms of procedure. There have been many such enactments in the nineteenth century. The whole administration of justice has been revised more than once; ancient courts have been transformed, new courts have been multiplied, and the rules of procedure have been amended again and again. We may consider first the civil and then the criminal courts, and in each case we may consider the superior courts first.

**Public Law and Procedure.**

With regard to the Courts of Common Law the first notable change in this century was the suppression of the separate Welsh judicature. Formerly there had been eight Welsh judges, inferior in dignity to the judges of the courts at Westminster, but discharging similar functions within the Principality. These judgeships were abolished by an Act of 1830, which added one puisne judge to each of the three superior Courts of Common Law. The procedure of the Courts of Common Law was amended and simplified by statutes of 1852, 1854, and 1860, which are known as the Common Law Procedure Acts. In the Court of Chancery, at the beginning of the nineteenth century, justice was dispensed by the Chancellor and the Master of the Rolls acting as judges of first instance, and an appeal lay only to the House of Lords. The increase of business led to the appointment of a Vice-Chancellor in 1813. Two more Vice-Chancellors were appointed in 1841 on the suppression of the equity side of the Common Law Court of Exchequer. In the year 1851 there was interposed between the House of Lords and the Court of Chancery the Court of the Lords Justices of Appeal in Chancery. Down to the passing of the first Judicature Act the procedure of the Courts of Equity had not been much modified by legislation.

**Common Law Courts.**

**Courts of Equity.**

The jurisdiction in testamentary and matrimonial causes had remained to the Ecclesiastical Courts until the year 1857, when it was transferred to the lay courts, newly estab-

Probate and Divorce.

lished. Power to pronounce a total divorce between man and wife was now first given to a court of justice. The new Court of Probate and the new Court for Divorce and Matrimonial Causes inherited much of the substantive law and procedure in use with their predecessors, and derived from the canon or the civil law. Although secular, they, with the older Court of Admiralty, formed a group apart from the Courts of Common Law and the Courts of Equity.

The Judicature Act, 1873.

Thus in spite of many considerable modifications the superior courts of justice preserved down to the year 1873 the same general outline which they had received in the thirteenth and fourteenth centuries. In that year was passed the first and most important of the Judicature Acts, which have transformed our courts and our procedure. The Judicature Act of 1873 was intended to effect three objects. It was to combine in one system the superior courts already existing: to compound a new procedure out of all that was best in the old procedure, whether of the Courts of Common Law or of the Courts of Equity, and to effect a fusion of the substantive rules of equity with those of the Common Law.

Courts before the Act.

At the passing of this Act the list of the superior courts was as follows. There were three superior Courts of Common Law—the Queen's Bench, the Common Pleas, and the Exchequer. From each of these courts an appeal lay to the Court of Exchequer Chamber, composed of all the Common Law judges except those belonging to the court where the case had been heard in the first instance. From the Court of Exchequer Chamber a final appeal lay to the House of Lords. There was, strictly speaking, but one Court of Chancery, though there were several Chancery judges. From the Court of Chancery an appeal lay to the Lords Justices of Appeal, and thence to the House of Lords. Distinct from the Courts of Common Law and of Chancery, alike in their history, in their jurisdiction, and in their procedure, stood the Court of Admiralty, the Court of Probate, and the Court for Matrimonial Causes. Appeals from the Court of Admiralty were carried to the Judicial Committee of the Privy Council. Appeals from the Courts of Probate and Divorce were carried to the House of Lords. For judicial purposes the House of Lords consisted of the Chancellor and the "law lords," that is to say, peers who had held high judicial office. These were men

THE ROYAL COURTS OF JUSTICE.

eminent in their profession, but often unfitted by years and infirmities for the task of judges of appeal.

All these courts were concentrated in London. To them we must add the superior courts of the Palatine Counties, the Chancery Court and Court of Common Pleas of Lancaster and the Court of Pleas at Durham.

Courts after the Act.

The Judicature Act of 1873 created a Supreme Court of Judicature, which was to consist of two parts, a High Court of Justice and a Court of Appeal. In the High Court were to be consolidated all the existing superior courts of first instance. Each of the three Courts of Common Law was to become a division of the High Court, and ultimately all were to be merged in the Queen's Bench Division. The Court of Chancery was to form another division; the Courts of Admiralty, Probate, and Divorce were combined to form a third. The London Court of Bankruptcy, the Court of Common Pleas at Lancaster, and the Court of Pleas at Durham, were also merged in the High Court. The Court of Appeal was to take the place of the Court of Exchequer Chamber and of the Lords Justices of Appeal in Chancery, and also (as originally contrived) of the House of Lords and the Judicial Committee of the Privy Council. By the Appellate Jurisdiction Act of 1876, the former jurisdiction of the House of Lords and of the Judicial Committee has been maintained, with the Court of Appeal as an intermediate tribunal between the High Court and the House of Lords.

Now that the Common Pleas Division and the Exchequer Division have ceased to exist, the distribution of judges is as follows. The Queen's Bench Division consists of fourteen puisne judges, with the Lord Chief Justice as President. The Chancery Division consists of the Lord Chancellor, as President, and five puisne judges. The Admiralty, Probate, and Divorce Division contains two judges, of whom one is styled President. The Court of Appeal consists of the Master of the Rolls, who no longer acts as a judge of the first instance, five Lords Justices of Appeal, and the presidents of the several divisions of the High Court.

The House of Lords as a court of appeal was remodelled by the Act of 1876. It now includes, besides the Chancellor and the persons formerly known as the law lords, four Lords of Appeal in Ordinary. These are appointed by the Crown

under the provisions of the Act. They must have practised at the Bar for fifteen years, or must have been judges in one or other of the superior courts. They receive a salary of £6,000 a year. They are only life peers, but they have all the rights

THE FUSION OF LAW AND EQUITY.
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of other peers, even after they have retired from their office. For the purpose of hearing causes three members of the House form a quorum.

The second object of the Judicature Act of 1873 was the reform of procedure. Details of procedure were left to the judges, who were empowered to make rules of court, which if not called in question in Parliament within a fixed time acquire the force of law. In the main the new procedure was to be a

Reform of Procedure.

combination of all that was best in Common Law procedure and Equity procedure.

In the Courts of Common Law trial by jury was the invariable rule. Trial by jury was not known in the Court of Chancery. The employment of a jury in the Chancery Division or in the Queen's Bench Division is now largely a matter of convenience and the choice of the parties. In the Common Law courts a question of law was decided by all the judges. In the Court of Chancery one judge was competent to decide any point of law, and this rule has been adopted in our modern procedure. In the Courts of Common Law evidence was given orally; in the Court of Chancery it was given on affidavit. The modern procedure in both divisions prefers oral evidence, but admits evidence on affidavit when it is the best that can be obtained. A rule of the Common Law (abrogated, however, long before the Judicature Act) forbade a party to a suit to give evidence. In the Court of Chancery evidence was often extracted from the defendant. At the present day the parties may be witnesses in either Division. Repeated attempts have been made to abridge pleadings and to expedite judgment; but the cost and delay of civil proceedings are still grievous, and the extreme facility of carrying an appeal from court to court is a serious defect in our modern procedure.

The Judicial Committee.

Before quitting the subject of the superior courts, something must be said respecting the Judicial Committee of the Privy Council. The jurisdiction of the superior courts hitherto considered did not comprise ecclesiastical causes, appeals from the Court of Admiralty or from prize courts, or appeals from courts in our colonies or foreign possessions. Appeals from the Ecclesiastical Courts were heard by the Court of Delegates. The members of this court were appointed by royal commission under an Act of Henry VIII. Appeals from the Court of Admiralty were made to the same tribunal. The Privy Council heard appeals from the prize courts and from colonial courts. An Act of 1832 transferred to the Privy Council the jurisdiction of the Court of Delegates. But the Privy Council had long been unsuited to discharge the function of a court of justice. It was a large body, chiefly composed of persons without legal knowledge. Its legal

members would naturally do its legal business, but no such division of labour had yet been enforced by law. What is known as the Judicial Committee of the Privy Council was first established by an Act of 1833. Under this Act the Judicial Committee was to consist of the Lord Chancellor and other persons holding high judicial office, together with two members specially appointed. Under a later Act the Queen was authorised to appoint four paid members of the Judicial

*Photo: Walker & Cockerell.*

RT. HON. SIR A. J. E. COCKBURN, BART.,
BY A. D. COOPER.
(*National Portrait Gallery.*)

Committee, who must either at the time of their appointment or at some previous time have been judges of a superior court either in England or in India. As the persons thus appointed die or retire their places will be filled, under the Act of 1876, by the Lords of Appeal in Ordinary. For all practical purposes the Judicial Committee consists of the paid members. The procedure of the committee bears traces of its origin from the Privy Council. Its judgments are couched in the form of advice unanimously given to the Sovereign. The Judicial Committee sits in Downing Street. No other court recorded in history has had so wide a jurisdiction, or has had to administer so many different systems of law.

The inferior courts for civil causes are known as the County Courts. These must be carefully distinguished from the

County Courts.

county courts of medieval history. Owing to the small size of the kingdom, the early predominance of the central government, and the system of circuits, the ancient local courts throughout England fell early into decay. In the beginning of this century there was practically no provision for the local administration of justice in civil causes. The only exceptions were such courts as the Lord Mayor's Court in the City of London, or the Court of the Hundred of Salford. With the growth of business and population the inconvenience became intolerable. Lord Brougham proposed the establishment of a system of local courts; but it was only in 1846 that the present county courts were established. For this purpose the kingdom has been divided into a number of districts. Each district corresponding with a Poor Law Union has a county court of its own, and the style of County Court is therefore misleading. The districts are grouped into circuits, and all the courts in a circuit are held by the same judge. In all there are fifty-nine circuits, but a few are at present without a judge. The County Court Judge is appointed, and can be removed, by the Lord Chancellor. He must be a barrister of at least seven years' standing. His salary is paid by the State, and he may not sit in the House of Commons. He is assisted by a registrar, who is always a solicitor by profession, and who can act for the judge in undefended causes.

The jurisdiction of the county courts extends to all cases of contract where the sum claimed does not exceed £50, and to most cases of civil injury where the damages claimed do not exceed that amount. A variety of other legal business has gradually been transferred to them, but their chief concern is with the recovery of petty debts. As regards procedure a jury is not necessary unless the sum in dispute exceeds £5, and either party demands one. The jury consists of five persons. A party may appear either in person or by his solicitor, or he may employ a barrister. Upon points of law there is an appeal to the High Court if the judge gives leave, or as a matter of right if the sum claimed exceeds £20. An appeal from a county court is sometimes carried to the House of Lords. But hundreds of thousands of petty causes are rapidly and cheaply decided by the county courts.

**Criminal Procedure: The Central Criminal Court.**

The administration of justice in criminal cases is still based upon the ancient system of circuits, and most of the work is done by the Justices of Assize. But the extraordinary growth of London in the present century led to the erection in 1834 of a permanent court for the trial of indictable offences committed in the capital and the adjoining parts of Kent, Middlesex, and Surrey. This is known as the Central Criminal Court. The Lord Mayor, the Lord Chancellor, all the judges of the High Court, the Aldermen of the City, and certain other dignified persons are judges of this court. In practice everything is done by judges belonging to the Queen's Bench Division. In extent of jurisdiction and in procedure the Central Criminal Court almost exactly resembles the Assize Courts.

**Quarter Sessions.**

Below the Central Criminal Court and the Courts of Assize come the Courts of Quarter Sessions in the counties and the largest boroughs. In the counties the Court of Quarter Sessions is still composed of all the justices of the peace. To the justices nominated in the traditional way must now be added the chairmen, for the time being, of the County Council and of the district councils within the county. The Quarter Sessions of the large boroughs are held by a Recorder, who must be a barrister of at least five years' standing. In the present century almost all the graver indictable offences have been transferred from the jurisdiction of Quarter Sessions to the jurisdiction of the superior courts. Petty offences are still tried by the justices in town and country. A single justice may not inflict a fine of more than 20s., or imprisonment for more than fourteen days. The summary jurisdiction is therefore exercised in most cases by two or more justices in Petty Sessions. The Crown, however, is authorised by statute to appoint stipendiary magistrates in London, in municipal boroughs, and in any town of more than 25,000 inhabitants; and the stipendiary magistrate, who is always a professional lawyer, has all the powers of the Petty Sessional Court. The summary jurisdiction has been remodelled by the Acts of 1848 and 1879, and under the latter Act the Petty Sessions have certain powers of trying indictable offences. Thus any indictable offence committed by a child under twelve years of age, other than homicide, may be summarily dealt with if the

**Police Courts.**

parent or guardian consent. Any accusation in the nature of larceny or embezzlement against a person under sixteen years may be summarily dealt with if the accused gives consent. So may an accusation of this kind against an adult if the value of the property in question does not exceed 40s. Lastly, an adult who pleads guilty to a charge of larceny or embezzlement, even where the value exceeds 40s., may be summarily dealt with if he has not previously committed an indictable offence. The heaviest penalty which can be inflicted by a court of summary jurisdiction, is a fine of £25 or six months' imprisonment with hard labour. If an offender is imprisoned without the option of a fine, he has an appeal to Quarter Sessions. If he wishes to raise a point of law he may ask the Petty Sessions to state a case for the High Court, and if the Petty Sessions refuse, he may move the High Court for an order requiring a case to be stated. Owing to the enlargement of the summary jurisdiction a great number of charges for indictable offences never go to the Quarter Sessions or the Assizes. And since the Petty Sessions are narrowly restricted in their power of inflicting punishment, there results an indirect mitigation of the severity of the criminal law.

**Changes in Criminal Procedure.**

Something may here be said regarding the improvement of criminal procedure in the course of this period. In 1836, prisoners who had previously been allowed the help of counsel for other purposes, were allowed to employ counsel to make their defence, and were thus placed upon an equality with their prosecutors. The requirement of an oath on the Gospels to be taken by witnesses has been so modified that persons of any or of no religion may give evidence with a clear conscience, and with full liability to the pains and penalties of perjury. The perverse rules which forbade an accused person, or the husband or wife of an accused person, to give evidence have been broken through in certain cases, and will probably be abrogated altogether. Jurors are no longer denied food or fuel in order to famish them into unanimity. A Director of Public Prosecutions has been created to take care that justice is not defeated for want of a private person to prosecute; but up to the end of this period he had not yet been of much service to the public.

Another improvement in the administration of criminal justice was made by the Act establishing the Court for Crown Cases

Reserved. Subject to certain qualifications, too technical to be explained here, it may be said that English law does not confer any right of appeal against the sentence of a criminal court. But an Act of 1848 empowers the judge or the justices in Quarter Sessions to reserve any point of law for the opinion of a court consisting of at least five judges now belonging to the Queen's Bench Division, of whom one must be the Lord Chief Justice. The prosecutor or the person convicted may appear and argue his case, either in person or by counsel, and judgment must be given in open court. The court has the amplest power to reverse, amend, or affirm any judgment given in the court below. It is not strictly a Court of Appeal, but rather a court to determine doubts as to the law entertained by the judges who hear criminal causes. So well settled is the criminal law that such doubt is rarely possible, not twenty cases in a year, according to Sir James Stephen, coming before the court. No provision has yet been made for an appeal from the finding of a jury on a question of fact. **Criminal Appeals.**

The progress of reform in substantive law has especially affected the Law of Property, the Law of Contract, and the Law of Corporations. The law of real property, "the Herculaneum of feudalism," being the most archaic part of the law, has undergone the most extensive alteration.

Many attempts have been made to facilitate the buying and selling of land. Thus the Prescription Act of 1832 has virtually abolished the curious doctrine of time immemorial, and has made it possible to acquire profits and easements (*e.g.* rights of common or rights of way) by peaceable enjoyment for comparatively brief periods. The Statutes of 1833 and 1874 for the limitation of actions relating to realty have not only curtailed the time within which the owner may sue a stranger in possession, but have deprived him of his title altogether unless he sues within that time. The Fines and Recoveries Act of 1833 has substituted a simple disentailing assurance for the clumsy collusive actions formerly necessary to bar an entail (*i.e.* to convert an estate tail into an estate in fee simple). The Acts for the Amendment of the Law of Real Property have simplified the methods of conveying land, and the Conveyancing Acts of 1881 and subsequent years have done much to abridge the necessary legal documents. Another series of Acts culminating in the Settled **Land Law Reform.**

Land Act of 1882 has enabled the limited owner, whether tenant in tail or tenant for life, to convey to the purchaser of his land an estate in fee simple, and has annulled by anticipation every contrivance for depriving him of this power. These Acts have rendered useless all the expedients formerly employed to keep land in the possession of one family for an indefinite period. Land is still made the subject of settlements, but a settlement now assures to the posterity of the tenant for life not the land, but only a certain amount of wealth, whether invested in land or in certain securities. In spite of all these reforms, the trouble and expense of proving a title are often considerable, and form an appreciable obstacle to free dealing in land. The complete removal of this obstacle can be effected only by a good system of registration. Two of our greatest lawyers have tried to establish one—Lord Westbury, in 1862, and Lord Cairns, in 1875—but with only partial success.[1]

Other Acts have provided for the enfranchisement of copyholds, for the commutation of tithe, and for the extinction of the troublesome right of dower. Land has been made fully liable for the debts of a deceased owner, and the heir or devisee of a mortgaged estate can no longer claim that the mortgage debt shall be paid out of the personalty of his predecessor. The law of mortmain and charitable uses has been recently revised and consolidated. The Settled Land Act of 1882 has enabled a tenant for life to grant agricultural, building, or mining leases for long terms. It has also enabled him to expend money derived from the sale of part of the settled land in executing certain permanent improvements upon the land which he retains. The Agricultural Holdings Act of 1883 has secured to the tenant of agricultural land the value of permanent improvements which he has executed. The Allotments Act, 1887, and the Small Holdings Act, 1892, have given the labourer facilities for cultivating land on his own account. The enclosure of commons has been regulated not merely in the interest of those who have rights in the common land, but to provide for the healthy recreation of the general public.

The Law of Contract has gained in importance through the

[1 The Land Transfer Act of 1897 carried the process a step further by empowering the Crown to make registration compulsory in any county or part of a county.]

vast increase of business transactions in the present century. In this field, however, more has been done to codify existing law than to introduce new principles. Thus the Bills of Exchange Act, 1882, comprises the entire law of negotiable instruments. The law of partnership was codified in an Act of 1890, and the law relating to the sale of goods in an Act of 1893. The Judi- **Law of Contract.**

RICHARD, LORD WESTBURY, LORD HIGH CHANCELLOR OF ENGLAND, BY SIR F. GRANT, P.R.A.
*(By permission of the Treasurers of the Middle Temple.)*

cature Act of 1873 has facilitated the transfer of rights arising under a contract. The Infants' Relief Act of 1874 has rendered contracts by persons under age for goods supplied other than necessaries or for money lent absolutely void, whereas at Common Law they were only voidable. The Married Women's Property Act of 1882 has vastly enlarged the contractual capacity of married women. Special forms for particular classes of contracts have been imposed by various statutes. Exceptional pains have

been taken to render the promoters of companies liable for misrepresentation of fact to persons taking shares. Notwithstanding all these statutes the law of contract remains for the most part case-law.

Company Law.

The Law of Corporations has been enlarged chiefly by the enormous growth of company law. The State has always reserved to itself the power of creating corporate bodies. For a long time this power was exercised either through an Act of Parliament or through royal charter or letters patent, and in either case the instrument creating the corporate body defined its character and organisation. This procedure may have sufficed so long as commerce and industry were carried on chiefly by private individuals, and trading corporations like the East India Company or the Bank of England were exceptional; but when commerce and industry, outgrowing individual resources, came to be more and more carried on by joint-stock companies, it was necessary to devise a simple and uniform procedure for their creation, and to enact full and precise rules for their government. Companies invested with exceptional powers, such as railway companies, still require an Act of Parliament for their creation, though even here certain general provisions have been enacted once for all (*e.g.* in the Lands Clauses Consolidation Acts), and applied by reference in the Acts creating particular companies. The law determining the rights and duties of railway companies alone would already fill many volumes. As regards ordinary trading companies the Companies Acts from 1862 onwards have provided for their easy creation and for the conduct of their business (p. 498). The reported cases which elucidate these Acts may be counted by thousands.

Shipping.

In the principal maritime country of the world shipping has naturally attracted the attention of the legislature (p. 825). The law of ships was consolidated in the Merchant Shipping Act of 1854, now repealed, and again in the Merchant Shipping Act of 1894, the longest and most elaborate Act on the Statute Book.

Labour Laws.

The relations of employer and employed in almost every branch of industry—in mines, in factories, in workshops, and on board ship—have been regulated over and over again in a multitude of Acts, which are noticed in other chapters

of this volume.[1] The liability of the employer for injuries sustained by the workman in the course of his service was not settled till 1897, and then only in certain specific trades and industries.

G. LE M. GRETTON. The Army.

When the successive waves of excitement caused by the Crimean War, the Indian Mutiny, and the threatened French invasion had subsided, thinking men began to realise that the want of elasticity in our military system was a serious danger to the State. Before the Mutiny, only 30,000 of the queen's troops had been stationed in India, but after the outbreak in the native army it was decided to maintain a garrison of nearly 70,000 Britons in that country. Thus a large proportion of the British army was permanently withdrawn from the defence of the United Kingdom and the colonies. To replace them adequately in time of war it was essential that the Government should command a large reserve of well-trained men, fit at once to take the field; but though the War Office endeavoured to organise such a body of old soldiers, its efforts were so unsuccessful that the militia practically remained the only reserve of troops upon whom the country could count in case of need. In 1866 the "Seven Weeks' War" between Prussia and Austria proved that it was possible for an army, small in time of peace, to be capable of immense expansion in case of war; for as soon as the Prussian army was mobilised tens of thousands of well-trained reservists rejoined its ranks, and brought up its numbers to full war strength.

Mr. Cardwell's Reforms.

Anxiety at our own failure to form a reliable reserve, astonishment at the brilliant success of the Prussian arms, and embarrassment at our ever-increasing deficiency of recruits, paved the way for the introduction of the short-service system, by which Mr. Cardwell, then Secretary of State for War, revolutionised the army. Had England, like Germany, adopted the system of compulsory and universal service, and had she, like Germany, possessed no important colonies, no coaling stations, no Indian empire, Mr. Cardwell's task would simply have been that of the copyist. But he had to devise a system

[1] *Cf.* pp. 298, 300, 312, 528.

based on that of Prussia, yet suitable to an army recruited by voluntary enlistment, and of which half the strength is ever serving beyond the borders of the United Kingdom. He had to provide that the army in India should always be kept up to its full war strength, and the colonies and the coaling stations adequately garrisoned. He had further to arrange that the army at home should be prepared, not

*Photo: Walker & Cockerell.*

EDWARD, VISCOUNT CARDWELL, BY GEORGE RICHMOND, R.A.

*(National Portrait Gallery.)*

only to supply the troops for small expeditions abroad, but also to make good the annual waste in the strength of the forces in India and the colonies, whether caused by death, invaliding, or transfer to the reserve. Finally, he had to create in England a strong reserve of thoroughly trained soldiers, ready to rejoin the ranks at a moment's notice. To provide such a reserve short service was essential; and this system, which has now obtained in the British army for a quarter of a century, was definitely adopted by the Govern-

ment in 1870. Young men of ages varying from eighteen to twenty-four are enlisted for twelve years, of which six years or more are spent "with the colours" (as service in the army is termed), and the remainder are passed in the reserve, where the soldier is free to carry on his civilian avocations, though liable to be recalled to the colours in time of need. It is obvious that under this system far more recruits are required than in the days of long service, and to obtain them the territorial system was devised, by which infantry regiments, linked together in pairs, were assigned to the counties with which they were connected by sentimental or historic ties. Pitt's system (Vol. V., p. 715) of associating the militia with the regular army was revived and amplified; the militia and the volunteers were attached to the line regiments which are "localised" in (*i.e.* assigned to) their county; and this combination of regular and auxiliary forces was termed a territorial regiment. In each county were built large barracks, depôts, which serve as recruiting offices and training schools for the newly-enlisted regulars and militia-men, who side by side there receive their first lessons in discipline and drill. Not only did this association with the line greatly improve the militia from a military point of view, it also so familiarised them with the service that out of the 34,000 men who, about 1895, annually enlisted into the regular army about 14,000 were volunteers from the Constitutional force. In 1885 the strength of the army was about 180,000; but in the next ten years there was a considerable increase in its numbers, which in 1895, exclusive of the reserve, was about 213,000 men of all arms. To these must be added 80,000 men in the first-class reserve and 30,000 of the militia who, for a small annual bounty, had taken upon themselves the same liabilities as the first-class reserve.

**The Territorial System.**

**Strength of the Army.**

The plan of closely connecting each battalion with a particular part of the country proved successful; local *esprit de corps* was stimulated, and the interest of the civilian population in the army sensibly increased. In 1893 it was ascertained that of the infantry nearly 56,000 had been born and bred in the districts to which their battalions were localised.

To insure a regular supply of men for the Indian and

colonial garrisons it was decided that one or other of the battalions of each regular regiment shall always be on foreign service, drawing its reinforcements from the battalion at home. From the depôt the recruits are transferred to the English battalion, where their education is carried on until they are drafted into the battalion abroad, where their military training is continued until their time comes to return to England and pass into the reserve, in which there were in 1895 about 80,000 soldiers, young men in their prime, forming the backbone of the first fighting line of the army at home. On the two occasions in our period that the reserve was called out, 95 per cent. of the men responded to the summons, and showed, by the perfect ease with which they resumed their military duties, that they had forgotten nothing since their return to civil life.

Competition for Commissions.

The short-service system is not the only improvement which the nation owes to Mr. Cardwell. When he took office in 1868, though a certain number of appointments to cavalry and infantry regiments were offered for competition, the large majority of commissions were obtained, not by merit but by favour. Except in the scientific corps (the engineers and the artillery), professional education was at the lowest ebb. Owing to the vicious system by which all responsibility was centred in two or three of the officers of each regiment, the remainder had so little to do that to hold a commission in the cavalry or infantry was not considered to involve serious work, but rather to be a light and agreeable occupation for rich men, to whom the purchase system gave many advantages over their less wealthy comrades. Before 1874, when Mr. Cardwell retired from office, all this had been changed. Thanks to the abolition of purchase (p. 524), officers no longer found themselves compelled to pay large sums of money for almost every step of promotion, under the penalty of seeing their wealthy juniors "purchase over their heads." The complete adoption of the principle of open competition for all commissions rendered it possible for young men with brains, but without interest or money, to force their way into the charmed circle of the British army. The career of arms became a profession in which talent and industry were allowed fair play. These innovations naturally raised a storm of indignation, and

Abolition of Purchase.

it was loudly asserted that the social status of the officers would completely change. But time proved that the successful candidates were still drawn from the same rank of life as of old.

THE ABOLITION OF PURCHASE, 1871—AJAX DEFYING THE LIGHTNING.

(*Reproduced by special permission of the Proprietors of "Punch."*)

Officers, moreover, were compelled to study their profession —to pass qualifying examinations in fortification, tactics, military law, and topography, before they obtain promotion to a higher rank. These tests were originally instituted in 1871 for subalterns, and were afterwards extended upwards. Schools of gunnery, of musketry, of engineering were also established, as well as classes on every conceivable military subject, even to shoeing a horse and recognising whether the meat issued for

Military Education

the men's rations is fit for human food. In addition to the brain-work which all these professional studies involved, much work and great responsibility was thrown upon regimental officers in training the men under their immediate command, and instruction was also provided for the sergeants and rank-and-file, as well as for the children of the married non-commissioned officers and men.

**Standing Camps.**

When the British army landed in the Crimea (p. 360) it was found that few of the troops had any practical knowledge of camp-life, and that the different arms were wholly unused to working together. To prevent the recurrence of so disastrous a state of affairs, large permanent camps of exercise were formed, and the troops are taught to manœuvre across country in combination with each other under conditions to some extent resembling those of active service. In 1853, again, shooting was a lost art in our army, and men were hurried to the Crimea who had never fired a round of ball cartridge in their lives (p. 172). By 1885 each infantry-man was carefully and systematically taught the use of his rifle, and fired at least 200 rounds a year in practice at the butts.

**The Soldier in Barracks.**

Among the many admirable changes which have taken place during the last thirty or forty years, the improvement in the condition of the soldier is, perhaps, the most remarkable. The squalor and indecency in barracks (p. 169) had become by 1885 a thing of the past. The barrack rooms were bright, airy, not overcrowded, and well provided with bath rooms and lavatories. The tentlike-screens round the beds of the soldiers' wives had disappeared; and married people had come to be now provided with comfortable quarters, separated from each other, and quite apart from the buildings occupied by the single men. At some stations large dining halls had been built, and throughout the army the greatest care is taken that the rations should be adequate, varied, and well cooked. In every barrack there are rooms set apart for the regimental institute—a soldiers' club and co-operative store combined. In some stations, billiard tables, shooting galleries, fives courts and skittle alleys have also been provided for the men: and regimental football clubs turned out mixed teams of officers and privates, who played for the military challenge cups competed for in every district. The allowance of furloughs

and, for recruits at the depôt, occasional visits home at a "week-end," not only keep up family ties, but maintain local connections, invaluable in helping the men to obtain work when they return to civil life on passing into the reserve.

The Morals of the Soldier.

Outside the barracks, in every garrison town, there are "Soldiers' Homes and Institutes," where men are welcomed and entertained by philanthropic people who wish to keep them out of mischief in their spare time. Thanks to all these efforts to

SOLDIERS' RECREATION ROOM, ALDERSHOT.

civilise the men, to the better class of soldier whom short-service has attracted to the ranks, and above all to the excellent example now set by the officers to the rank-and-file, good conduct and sobriety are increasing every year in the army. The modern English soldier has discovered that there are pleasures in life other than those of inebriety: he looks forward to the future and places money in the regimental savings bank; he is in every way as respectable a member of society as the young civilians of the rank of life from which he springs. In point of material comfort he is far better off than they, and he knows that no strikes, no hard winters, no depression in trade will throw him out of work. His "deferred pay," held back

until his transfer to the reserve, enables him to start respectably in civil life. The remuneration of the non-commissioned officers has been increased by one-half to two-thirds since the beginning of the century.

The Militia.

During the closing years of the period there was a steady improvement in the efficiency of the militia, especially after the War Office ceased to lodge the men in the public-houses and the slums of country towns during the annual training of the regiments. Though Wellington had decided that each soldier should have a bed to himself, the authorities had considered that this order did not apply to the militia, who were accordingly "doubled up," two in a bed, in quarters where the whole surroundings were thoroughly demoralising. Happily this is now all changed. At the close of our period, however, the troops were trained in standing camps or barracks, where they not only learn drill, shooting, and regimental routine, but they also acquire invaluable habits of discipline, cleanliness, and punctuality. The total of the various bodies of infantry, artillery, fortress engineers, and submarine miners, who assembled for instruction in 1894, was about 100,000; of these about 8,000 were old soldiers, who, on the expiration of their service in the army and reserve, voluntarily enlist in the militia. During the war in the Soudan in 1885 there was a partial embodiment of the infantry and artillery militia, to strengthen the garrison of England, which had fallen much below its usual numbers: about 20,000 men were called up, and for seven months did duty in various parts of the United Kingdom. With so little friction and difficulty was this addition to the strength of the regular army effected that comparatively few people in England were aware that any embodiment had taken place.

Yeomanry and Volunteers.

The depression in agriculture acted injuriously upon the Yeomanry Cavalry; farmers became less and less able to afford the expense of serving in this force, which by 1896 dwindled to about 9,000 sabres. The numbers of the volunteers, on the contrary, increased between 1886 and 1896 from 215,000 to 231,000; but the dearth of officers in this branch of the service has seriously militated against its efficiency. There were, in 1896, no less than 1,800 commissions vacant, for which applicants were not forthcoming.

Among the most important alterations in our military system effected during Mr. Cardwell's tenure of office was the deliberate reversal of the Duke of Wellington's policy of scattering the army in detachments throughout the colonies. The troops were gradually withdrawn from Canada, Australia, and New Zealand, and either concentrated in the United Kingdom, or sent to garrison the over-sea fortresses and coaling stations, which serve as bases of operations for the fleets to which the

**Concentration of the Imperial Army.**

[*Photo: Symonds & Co., Portsmouth.*

THE SOLDIERS' INSTITUTE, PORTSMOUTH.

aggressive defence of the empire is entrusted On the great self-governing colonies was thus thrown the burden of providing for their own local protection. The Governments of those smaller colonies in which Imperial garrisons are still stationed, have largely contributed to their defence by raising auxiliary volunteer corps. The total effective strength of the various forces of the colonies, including their local regular soldiers, militia, volunteers, and armed military police, in 1892, amounted to the very respectable total of 91,000 men. Twice in the period covered by this chapter did the colonies offer contingents of their local troops to the Imperial Govern-

Colonial Troops Oversea.

ment during a campaign. In 1881, within twenty-four hours of the news of our defeat at Laing's Nek, 2,000 Australian militiamen had volunteered for service against the Boers. Their offer of help was rejected; but in 1885, 800 stalwart men from New South Wales fought side by side with British and Indian troops at Suakim, on the Red Sea, while a band of Canadian *voyageurs* shared in the perils of the Nile Expedition with their brothers from the "Old Country."[1]

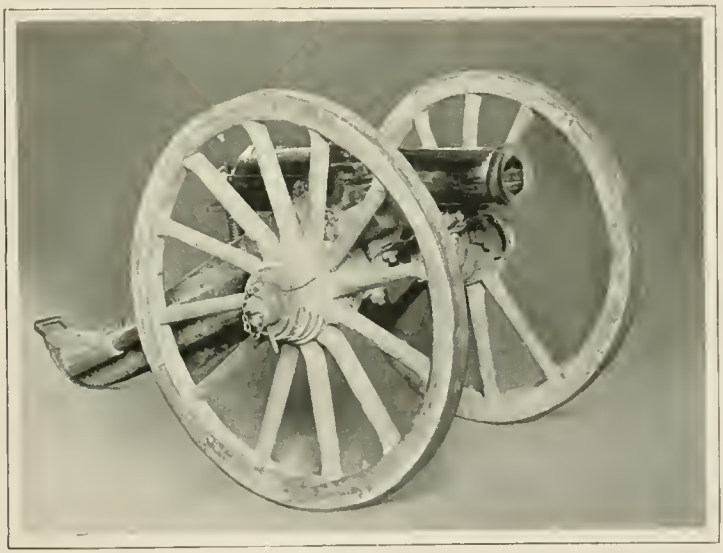
Tactics and Arms.

The axiom of Napoleon that "tactics change every ten years" has been fully verified during the last quarter of a century. This generation has seen the science of handling men in action, if not wholly revolutionised, at least constantly modified by the improvements which have from time to time been effected in firearms and in explosives. Rapidity of fire has been greatly augmented by the invention of breechloaders and of magazines. Accuracy of shooting has been equally increased by the improvements in the grooving of rifle-barrels. An enormous length of range has been obtained since gunpowder was virtually superseded by cordite, an explosive of remarkable strength and one which produces so little vapour on ignition that it is popularly known as "smokeless powder." To what extent the absence of smoke on a battlefield will influence the disposition of troops is one of the many problems which only the result of the next European war can solve. The most difficult question of all had been to devise a formation in which the infantry of the attack can cross the space swept by the defenders' fire. Before the wars of 1864, when breechloaders were first used in Europe, "the great object of offensive tactics on the Continent was to bring one or more sufficiently imposing infantry columns in good order up to the position of the defenders."[2] In 1870 the Prussians had not experienced on themselves the effects of breechloading fire, though they had used it with overwhelming success in the Danish and the Austrian wars, and they accordingly attacked the French in the small columns so popular in the German army during the last years of their struggle against the great Napoleon. But it was soon found

[1 The far more extensive help given during the South African War lies, of course, outside the scope of this chapter.]

[2 Hamley's "Operations of War," 5th ed., p. 424.

that under the hail of bullets which the French breechloaders poured into them, these columns dissolved into clouds of skirmishers, and that the attack was delivered, not by men fighting shoulder to shoulder, but by soldiers acting more or less independently of each other. To evolve order out of this disorder, to systematise the attack in extended order, has been the constant pre-occupation of the generals of every army since the war of 1870. All nations have now adopted



BRASS CANNON CAPTURED AT TEL EL-KEBIR.
(*Royal United Service Institution.*)

much the same views. They recognise that to bring up men in the face of an enemy armed with breechloaders is impossible until the *morale* of the foe has been greatly shaken. Therefore, the Napoleonic tactics of massing batteries against the point to be breached have been revived, and a crushing artillery fire is concentrated upon the troops who occupy the threatened point in the defenders' position. When they are considered to be sufficiently demoralised, the infantry is launched against them, in successive waves of skirmishers, constantly reinforced from the supporting troops in rear, who follow them at distances which are gradually diminished as

the enemy is approached. When the final bayonet charge is to be made, the reinforcements hurry up in line, and, carrying with them the survivors of the skirmishers, hurl themselves upon the enemy in overwhelming masses.

This method of fighting throws very great responsibility on the captains and subalterns, as the command virtually passes into their hands during the battle. As the fight grows fiercer, the strain on the men's nerves increases, and the amount of control over their firing and their general conduct which can be exercised by subordinates depends largely on the warlike training and the nationality of the individual combatants. In the latter respect no army has profited more by the extended order-fighting than ours.[1] To quote from a well-known military writer—

> The direction of modern infantry tactics is peculiarly adapted to the genius and temperament of the English people. For years British troops, formed in lines two deep, have met and defeated the best armies in Europe. Extended order is but an extension of the two-deep line. The steadiness of the individual British soldier, his coolness and his proverbial ignorance of the time when he is beaten, tend to make individual fighting simple and natural to him . . . The peculiar genius of a nation invariably comes out on the battlefield, and it is essential that it should be clearly understood that the British army, with its historic training and traditions of advancing and fighting never more than two deep, possesses qualifications for modern fighting that the army of no nation does."[2]

One of the many curious features of our military position is that though, as a European nation, we are compelled to assiduously practise the tactics of modern warfare, as a great colonial power our actual fighting is almost always against partially or wholly uncivilised races. In fact, although the British army was actively engaged in many parts of the world between 1865 and 1885, only twice—in the Transvaal in 1881, and in Egypt in 1882—did we encounter troops armed in European fashion. In each of our little wars our methods have to be adapted to local requirements, under the penalty of disasters such as that of Isandhlwana (p. 571).

At the commencement of the period with which this chapter deals the New Zealand War was not yet over, and

**Our Campaigns: Abyssinia.**

[1] Written in 1897. The South African and Russo-Japanese Wars have reopened many questions in tactics, but the text seems to need no alteration.]

[2] Hume's "Précis of Modern Tactics" (revised by Lieut.-Col. Pratt), p. 50.

British and colonial regiments were still engaged in "bush-whacking" against the insurgent Maoris. In 1868 it became necessary to send an army to Abyssinia to rescue a number of Englishmen whom the Emperor Theodore had imprisoned in his rock-fortress of Magdala. The military critics of the Continent, remembering our failures in the Crimea, were openly incredulous as to the possibility of England successfully organising an expedition into the heart of Africa. But this campaign proved that the bitter lessons of the winter of 1854 had not been altogether thrown away upon us. The transport and the commissariat did not break down in Abyssinia as they had done in the Crimea. Forty thousand animals—elephants, camels, and mules—carried the supplies for the troops, who, from their base of operations at Annesley Bay, marched to Magdala—a distance of 400 miles, across a savage and mountainous country, yielding but little food, and without roads worthy of the name.

**The Red River Expedition.**

Equally picturesque and satisfactory in organisation was the Red River expedition in 1870, when to a young colonel on the staff, afterwards Lord Wolseley and Commander-in-Chief, was entrusted the task of quelling a rising of Indian half-breeds on the prairies of Manitoba. At that time the only approach to Manitoba from Quebec or from Toronto was by water, from the north-west extremity of Lake Superior, over a network of lakes and rivers, in the heart of a wilderness which could furnish the troops with nothing but water and fuel. Of these the supplies were inexhaustible, but for this voyage of six hundred miles every other requisite had to be provided. On board the fleet of two hundred open boats, specially constructed for the occasion, were packed stores of every kind, guns and ammunition, camp equipage and food for sixty days. The crews consisted of twelve hundred fighting men, of whom more than half were Canadian militia, and four hundred Indian and French-Canadian *voyageurs*, who took charge of the handling of the heavily-laden craft when the navigation became dangerous. The labours of both officers and men were incessant. Forty-seven times it became necessary, in order to avoid impassable rapids or cataracts, to unload each boat, to carry by hand all its contents to the spot fixed for re-embarkation, to return to the little vessel and drag her bodily

over the "portage," and finally re-launch her, and re-pack her. So admirably had all the arrangements been thought out, so carefully had all the calculations been made, that in this expedition—then unique of its kind in the annals of war, though since far surpassed by the Nile campaign of 1885—nothing went wrong, and nothing had been forgotten, down to the tea which for the first time was issued to the men instead of spirit, with most excellent results on their discipline and their health.

KING KOFFEE'S UMBRELLA.

Our next little war was in 1873 against the Ashantis, who inhabit a district of the west coast of Africa, in which no pack-animal can live. The natives act as beasts of burden: and all the stores, ammunition, and provisions for the little army were transported upon the heads of stalwart negro porters. Though this method of carriage is most unsatisfactory, as the natives are liable in sudden fits of panic to throw down their loads and to disappear into the bush, yet so well were they watched, and so judiciously had Lord Wolseley and his staff made all their arrangements, that the British troops wanted for nothing on their march through the fever-stricken forests of Ashanti.

**Ashanti.**

KING PREMPEH'S UMBRELLA
*(Royal United Service Institution.)*

In 1877 Britain had two wars upon her hands. In India the intrigues of Russia had embroiled us with Afghanistan, and involved us in two long and arduous campaigns

against the Ameer. In South Africa we were fighting hard with the Zulus, a splendid race of savage soldiers who threatened the existence of the colony of Natal. In the earlier part of the Zulu war history repeated itself. As in the eighteenth century (Vol. V., p. 260) a column of British and provincial troops were destroyed in the forests of North America owing to the English general's contempt for the advice of colonial officers, so in the nineteenth century the uplands of South Africa were the scene of a similar disaster. A British force had encamped at Isandhlwana, on the borders of Zululand, and part of the troops were led by their general on a reconnaissance in force, while the remainder were left to guard the camp. The colonists who accompanied the expedition, men experienced in South African warfare, urged the absolute necessity of fortifying the camp by surrounding it with a "laager" of the transport waggons. They pointed out that the Zulus were fearless, and admirably drilled and disciplined in their own tactics. It was in vain; the camp was left "unlaagered"; ten thousand Zulus surrounded it and by sheer weight of numbers crushed the defenders. A few white men escaped with their lives; but the Zulus, besides capturing tents, stores, ammunition, rifles, and colours, slew no less than fifty-two officers and eight hundred and six non-commissioned officers and men of the Anglo-colonial force. The road into Natal lay open to them; there was nothing to prevent their raiding into the colony but a weak detachment of about a hundred and thirty men at Rorke's Drift at the crossing of the River Tugela. This post, which had been roughly fortified with "mealie" bags and biscuit tins, was fiercely assailed; but so splendidly did its little garrison defend it, that after a series of attacks lasting all through the night, the Zulus retired, leaving the plain covered with their dead. A few months later, when reinforcements had arrived from England, the battle of Ulundi broke the Zulus' strength, and in our satisfaction at the conclusion of the war, the bitter lesson we had learned at Isandhlwana, not to despise our enemy, was speedily forgotten. In 1880 the Transvaal, which had been annexed to Britain four years before, rose in rebellion against the handful of troops who were scattered over its vast area. The English general hastily collected a few hundred men, and without

The Afghan and Zulu Wars.

waiting for reinforcements from England, without reflecting that his foes were a race of hunters, trained from their earliest youth to trust to their rifle for their daily food, advanced against them. In three engagements the Boers signally defeated us. Probably for the first time in our national history, England allowed her defeats to remain unavenged (p. 537). The Ministry hastily made peace with the Boers, and a

*Photo. W. H. Pocock & Co., Capetown.*

MAJUBA HILL.

Convention was concluded with them, conceding autonomy, with certain reservations, under the suzerainty of the British Crown.[1]

There is no space even to mention the other campaigns which have occurred in the twenty years ending in 1885. In India, besides the Afghan War, there have been constant expeditions of varying importance, to maintain order among the savage races on our frontiers. In Egypt Lord Wolseley's campaign of 1882 brought into prominence the harmony with

[1 The precise meaning of this Convention, which subsequently was replaced by another omitting the term "suzerainty," was constantly in dispute until it was terminated by the war of 1899–1902.]

which the Army and Navy now work together, and the ease with which England can send a combined force to any part of the world. Three years later, when Lord Wolseley led an expedition up the Nile, the British soldier proved that neither short service nor School Board education have made him less handy, less gallant, less adaptable to his surroundings, than were his predecessors. It is no part of a soldier's ordinary duty to row boats or to ride camels, yet in 1885 many British regiments embarked in the fleet of 800 whale boats which covered the waters of the Nile, and picked detachments of all arms, mounted on camels, penetrated into a desert untrodden by European soldiers since a Roman army perished in its sandy wastes.

**Egypt and the Soudan, 1882-1885.**

THE peace of 1815 left the "great gun" very nearly where it had been a hundred years earlier. There had been no important increase in weight; and the only considerable improvements in naval gunnery had been the introduction of the carronade, or "smasher," for throwing comparatively heavy shot for short distances at a low velocity: and the adoption of the gun-lock in lieu of the various primitive arrangements for igniting the priming of the charge by means of red-hot irons, smouldering rope-ends, etc. The use of shells had also become more general, and the shell itself had been improved, though it was still employed almost exclusively in mortars. But as the century verged upon its middle age, attention began to be directed to the problem of the diminution of windage in heavy guns, with a view to obtaining greater accuracy and velocity by utilising as much as possible of the elastic force of the explosion, and allowing as little as possible of it to pass the projectile and escape without doing its due share of the work. In certain small-arms the problem had long before been dealt with by the adoption of the device of rifling the interior of the barrel, and giving to the grooves of the rifling a slight turn, which was found to increase accuracy by imparting a twist to the bullet. In the old muzzle-loading rifles the bullet was hammered, or violently forced, down upon the powder; but very little experiment showed that it would be vain to attempt to do with an iron projectile, weighing perhaps 68 lb., what could be done,

**W. LAIRD CLOWES. The Navy. Growth of the Gun.**

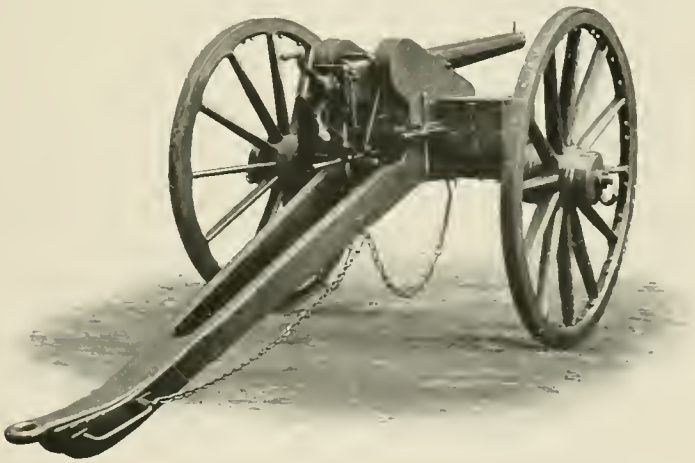
Rifled Cannon.

with comparatively small labour, with a leaden bullet weighing a few grains. Whitworth and others therefore devised an elongated bolt or projectile which, instead of being forced into the bore, was of size and shape to permit of its being pushed home with little exertion, but which, nevertheless, acquired a twisting motion in its flight by reason of some peculiar correspondence between a cross-section of the projectile and a cross-section of the bore of the gun, the bore being itself twisted. Whitworth's section was hexagonal: the section chosen by Lancaster was slightly oval. Yet still, as the projectile could not fit with more than approximate accuracy, there was much windage: and at length it became obvious that if windage was to be reduced to the lowest practicable point, the gun must be loaded not by the muzzle, but by the breech.

Breech-loading Cannon.

Sir William Armstrong, about 1858, was the first in England to turn the conclusion to advantage, by the invention of his first breech-loader. This was a tube, cut into near its rear end so as to admit of the dropping-in of a wedge or breech block, which then filled the aperture and closed the bore. A hollow screw, working in the tube from the rear, pressed the wedge home and held it fast. The gun, therefore, soon came to be known as the Armstrong screw-gun. But the system, though embodying great improvements, proved unsatisfactory, owing to the tendency of the wedge to jump out of its place upon the firing of the gun: and for a time there was a reversion to muzzle-loaders. Some of these, especially after the introduction of Armstrong's plan of building them up, instead of constructing them in one or two heavy pieces, were very large, and, all things considered, very powerful weapons; and towards the close of the muzzle-loading era, guns of this description, weighing as much as 80 tons, and having a calibre of 16 inches in diameter, were turned out for the Navy. Four of them were mounted in the battleship *Inflexible*, which was launched in 1876, and which did good work with them at the bombardment of Alexandria six years later. Before long, however, the difficulties in the way of securing a completely satisfactory breech arrangement were solved by Sir William Armstrong; and, after the opposition of prejudice and habit had been overcome, the year 1881 witnessed the launch of the *Conqueror*, the first British battleship armed exclusively with modern breechloaders. The

largest of these weighed only 45 tons each; yet even they were much better than any muzzle-loaders; and presently bigger guns on the same system were constructed, until, at the close of the epoch under review, guns weighing 111 tons were in existence, though not actually mounted on board ship, in this country. They were destined for the *Benbow*, which was begun in 1882 and launched in 1885. It will be interesting to compare the best smooth-bore gun of the end of the ante-breechloading



AN EARLY ARMSTRONG BREECH-LOADER.

(*From a photograph supplied by Sir W. G. Armstrong, Whitworth & Co., Ltd., Elswick, Newcastle-on-Tyne.*)

days (1859) with the best muzzle-loading gun of days of rifling (1876) and the best breechloading rifled gun of 1885:—

| Date. | Weight of Gun. cwts. | Calibre of Gun. ins. | Weight of Projectile. lbs. | Weight of Charge. lbs. | Initial Velocity ft. per sec. | Muzzle Penetration. ins. of iron. |
|---|---|---|---|---|---|---|
| 1859 | 95 | 8.12 | 68 | 16 | 1,490 | 3 |
| 1876 | 1,600 | 16 | 1,684 | 450 | 1,590 | 24 |
| 1885 | 2,300 | 16.25 | 1,800 | 960 | 2,087 | 38 |

Nor is this all. In the twenty-six years the length of the biggest gun of the day grew from 10 feet to 43 feet 8 inches; and the iron spherical projectiles, lying comparatively loosely in the bore, were exchanged for steel projectiles provided with soft copper circumferential bands in such a manner that as the missiles were driven through the gun the copper entered into

the grooving of the rifling so intimately as practically to abolish windage. One particular performance of the great gun of 1885 ought not to go unmentioned here, although the actual penetration of the gun was not determined until a few years later. An armour-piercing projectile was fired from it against a specially built-up target. The material traversed in succession was—compound (iron steel-faced) armour, 20 inches; iron, 8 inches; oak, 20 feet; granite, 5 feet; concrete, 11 feet; or, in all, 38 feet 4 inches. The projectile came to rest in other material just beyond the concrete. The cost of firing that shot was, it may be

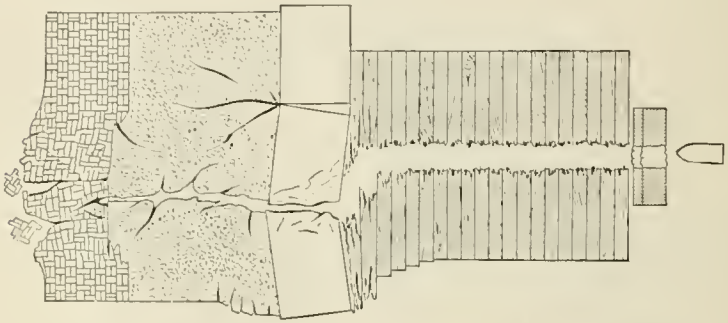


DIAGRAM SHOWING PENETRATIVE POWER OF AN ARMSTRONG GUN.

added—for the projectile, about £125, and for the powder, about £80; total, about £205. A little earlier a gun of similar type, but of much smaller size, had been fired with a high degree of elevation in order to test its extreme range, which was found to be 21,800 yards, or upwards of $12\frac{1}{4}$ miles. It is doubtful whether the best gun of 1859 could have thrown its shot, in the most favourable circumstances, to a distance of two miles and a half.

But all these improvements, striking though they were, were none of them final. Towards the end of 1881 the Government invited designs for a gun which should fulfil the following requirements:—The weight of the gun and its mounting were not to exceed half a ton; the projectile was to weigh six pounds, and to have a muzzle-velocity of not less than 1,800 feet per second; the projectile and powder-charge were to be made up in one cartridge: the gun was to require a crew of not more than three men, and it was to be capable of discharging at least twelve

*Photo: W. Symonds & Co., Portsmouth.*

H.M.S. *INFLEXIBLE* IN 1880.

Quick Firing Guns.

ained shots a minute. In reply Mr. Hotchkiss, Mr. Nordenfelt, and others, drew up plans and specifications for what have since been known as quick-firing guns. Time was saved, not merely by having charge and projectile in one cartridge, but also by simplifying and reducing the number of necessary motions in opening and closing the breech-apparatus. The result presently was the introduction to the service of 3-pounder guns that could be loaded and fired 30 times a minute; of 6-pounder guns that could be loaded and fired 25 times a minute; and of 12-pounder

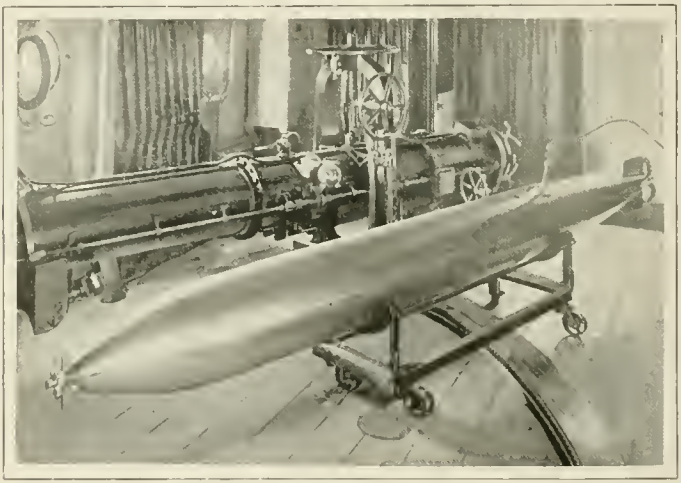


*Photo: W. Gregory & Co., Strand, W.C.*

THE WHITEHEAD TORPEDO.

guns that could be loaded and fired 20 times a minute. When to this is added the fact that the third quarter of the century also saw the general adoption of machine-guns—weapons which by mechanical arrangement can discharge an almost uninterrupted succession of small bullets—it will be realised what astonishing progress was made in that period in the art and science of killing.

Torpedoes.

A kindred development of the time was the automobile torpedo, of which the Whitehead may be regarded as the leading type. This torpedo is a spindle-shaped steel vessel, furnished with a screw driven by means of compressed air, and with a large charge of gun-cotton, capable of being exploded by

concussion. The machine was so arranged that it would automatically maintain itself at a given depth while running through the water, and would preserve its original direction. It was suitable for discharge, by means of tubes, either from ordinary ships, or from torpedo-boats peculiarly adapted for it: and as it was rapidly improved, until it became very accurate, it threatened, towards the close of the period under consideration, to revolutionise all preconceived theories concerning the methods of naval warfare. Large numbers of torpedoes were manufac-

*Photo: W. Symonds & Co., Portsmouth.*

TORPEDO BOAT IN 1880.

tured; and many torpedo-boats were built, constructors and contractors vying with foreign builders in producing faster vessels of the type than existed elsewhere. This rivalry had, indirectly, an important influence in bringing about enormous improvements in ships' boilers and machinery; and, with the new type of craft, speeds previously undreamt of were quickly attained.

After the commencement of the second quarter of the nineteenth century, improvements in the *matériel* of the fleet were introduced with ever-increasing frequency. The use of iron, presently to be superseded by steel, for the construction of hulls and for armouring; the general adoption of the screw; the accelerated speed of ships; the development of the power and

General Improvements.

accuracy of the gun; and the invention of the Whitehead torpedo, have been alluded to already; but there were hundreds of minor improvements of a not less significant character, and these affected almost every operation that is performed on board a man-of-war. Steam began to be employed not merely for propelling ships, but also for pumping them; for propelling their boats; for hoisting their boats in and out; for weighing anchor: and, in short, for doing all sorts of subsidiary work. Hydraulic power was next called in for many purposes, notably for loading heavy guns, for turning them in their turrets or barbettes, for elevating and depressing them, for controlling their recoil, and sometimes for hoisting up to them their powder and shell, and for placing these within them. As the period now being dealt with closed, a tendency was exhibited towards the supersession of even steam and hydraulic power, for certain purposes, by electricity. This power had already taken over the lighting of ships, and, to a limited degree, the transmission of orders and signals from one part of them to another. The ancient practice of heaving the log with a view to ascertaining the speed of a vessel, though persisted in, was to a large extent superseded by the introduction of various mechanical self-registering devices, driven for the most part by the automatic revolutions of a screw trailing astern of the moving ship. Improvements in the compass and in deep-sea sounding apparatus were introduced by Sir William Thomson, afterwards Lord Kelvin (p. 711); signalling from ship to ship was facilitated by the adoption of better codes and an increased number of flags for the purpose, as well as by the use of Colomb's system of flashing longs and shorts at night, in accordance with the principles of the Morse alphabet, and by the development of the semaphore: and the whole scheme of naval tactics underwent revision. The effective internal subdivision of ships became one of the chief aims of the naval architect: sails and rigged masts slowly disappeared from vessels of war; double bottoms and cellular methods of construction became the rule rather than the exception, and wire ropes took the place of many of the hempen ones for the support of such masts as remained, while the lower masts themselves were cylinders of iron or steel.

In the earlier days of the Royal Navy there was no regular

scheme for providing the service with officers. Some were obtained by promotion from the lower deck of ships of war; others were taken from the mercantile marine; yet others were transferred from the land forces; and not a few seem to have gone straight from civil life ashore to the novel responsibilities of the quarter-deck. But in all ages a custom, which was practically one of apprenticeship, prevailed—at least, to some extent. Captains took youngsters to sea with them; made them subordinate officers if they appeared to deserve promotion; and ever afterwards, so long as good behaviour warranted it, kept a friendly eye on their *protégés* with a view to securing their advancement as opportunity offered. Yet for a long period there scarcely existed such a thing as the naval career, for there was little or no continuity of service, nor was there any half-pay as a retaining fee. In war a certain class of people who had had previous experience naturally returned to a calling which was alike honourable and profitable; but in peace the greater number of these followed other employments. The first change of importance was the appointment of gunners, boatswains, carpenters, and pursers, as standing or permanent officers. The superior ranks continued to be filled by the temporary engagement and commissioning of persons who were more or less outsiders. Further developments were very gradual, though they all arose out of the ancient custom of captains taking with them to sea a retinue of servants and youngsters. The custom was officially recognised and sanctioned in Elizabeth's time, after which the captains drew pay and rations for these followers of theirs, and were thus enabled to provide some sort of start in life for the sons of their relatives and friends. It soon became usual for a captain to appoint his own lieutenant. He, of course, frequently chose one of his followers. Next, the status of midshipmen and lieutenants was recognised and regularised, and so a channel of promotion for deserving youngsters was insensibly established, though for a long time the steady flow of the current remained liable to interruption by appointments from outside. Under Charles II. the practice of admitting to men-of-war "volunteers by order"—or, as they were more commonly called, "king's letter boys"—was sanctioned; and formal regulations established the qualifications for attainment of the rank of lieutenant, and prescribed a rudimentary system

of examination for a commission. In 1728 the "king's letter" was abolished, and a Naval Academy was formed at Portsmouth, youngsters entering from it being granted certain advantages. But, comparatively speaking, few officers entered through the Naval Academy, so long as they could enter more easily as nominal servants or retainers of some friendly captain. Joining the Naval Academy involved actual presence and study there; joining as captain's servant did not necessarily involve, for several years at least, any active participation in the work of the service: for the inevitable abuses which grew up permitted a boy's name to be placed and kept on the books of one of the king's ships while he was still in the nursery or at school, and gave him the advantage, when he first went actually to sea, of finding several years of service already standing to his credit, and counting in favour of his eligibility for promotion. The bogus servant system existed until nearly the close of the eighteenth century. The Naval Academy at Portsmouth, as a door of entry, existed until 1837. Then succeeded a system by which volunteers, later called Naval Cadets, were entered on board large sea-going ships, which carried naval instructors to attend to their technical education. Special training-ships were next established at Portsmouth and Devonport, and in one of these, after passing a preliminary examination at the Royal Naval College at Portsmouth, the cadet was required to serve and study for three months and to qualify, ere being sent to sea. Finally, a single training-ship was considered to be sufficient. The Portsmouth one was chosen, and at the end of 1858 the then existing vessel there, the *Illustrious* not being considered suitable, and further changes in the direction of improving the course of training being contemplated, the *Britannia* was assigned to do the duty She was a fine 120-gun ship, that had been built in 1820, and had served as one of the flag-ships in the Black Sea during the Russian War. She was altered, and was commissioned for her new work on January 1st, 1859, since which date the cadets' training ship has always borne her name. The original vessel was moved to Portland in 1862, and thence, in the following year, to Dartmouth. In 1869 the vessel, being worn out, was withdrawn, and the *Prince of Wales*, which took her name, was substituted for her. Modifications of the earlier regulations were made from time to time, until, in 1885,

they were substantially as follows:—The system of admission was by limited competition, after nomination. Candidates were required to be not more than thirteen and a half, and not less than twelve years of age on July 15th (if going up in June) or on January 15th (if going up in November), following the examination. The course of training was for two years, at the expiration of which the cadet, his conduct and progress having been satisfactory, was appointed to a sea-going ship. He then passed for midshipman, and subsequently for lieutenant, becoming at first

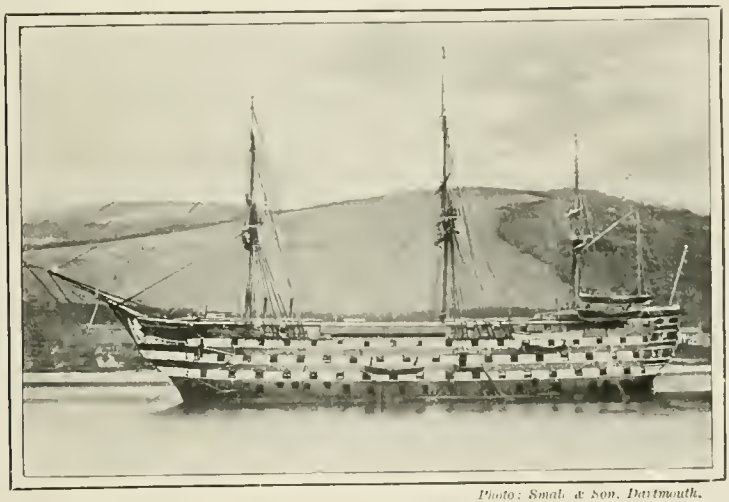


*Photo: Small & Son, Dartmouth.*

THE OLD *BRITANNIA*.

an acting, and then a full sub-lieutenant, and remaining one until the passing of further technical courses and examinations. His appointment to be lieutenant placed him in the way of promotion by selection, subject to sufficient time having been served, until his attainment of the rank of captain, after which his further promotion was by seniority. The establishment of the *Britannia*, or of some corresponding school, was rendered absolutely necessary by the greatly increased technical knowledge demanded of the naval officer after the introduction of steam as the general means of propulsion at sea, and after gunnery had become a really progressive science; yet the practice of cutting short a boy's education at the age of thirteen and a half had the natural but regrettable effect of seriously limiting

the average naval officer's mental culture; and before the new system had been in working order for a generation it began to be recognised that the change could not be regarded as final.[1]

Entry and Training of Seamen.

Still more radical alterations took place, as the century grew old, in the methods whereby the Navy was provided with seamen. During the old wars men either volunteered or were pressed, and when their services were no longer needed, the poor fellows, with comparatively few exceptions, were cast adrift, and had to find for themselves other employment, or starve. The country took care of those who had been wounded, or who had seen long service, or who had become petty or warrant officers; but as a rule the young men who, possibly contrary to their inclinations, had served only for one or two commissions, were thrown upon the world; and these were the majority. During the peace, impressment, though it still remained legal, was not often had recourse to, for only a small number of men were required, and these were generally provided by voluntary enlistment. But such a system, even in peace-time, could not produce satisfactory men. The Navy held out inducements to the improvident, the scampish, and the vicious, far more than to the steady and foresighted. So long as casual engagements were the rule, so long was something approaching to savagery necessary for the maintenance of any kind of discipline throughout the fleet. It was said, with nearly literal truth, of certain commanders in the 'thirties and the 'forties that they had flogged every man who had ever served under them. The habit of allowing large rations of rum (which had superseded the heavier but withal less injurious beer as the nautical beverage) to ships' companies increased the inborn tendencies towards disorder and crime; and presently it was decided that the only hope for improvement in the morals of the lower-deck lay in the introduction of continuous service. This was effected in 1852, and the happy results of the change have ever since been conspicuous. A further measure tending to promote *esprit de corps* and neatness was the adoption, in 1857, of a uniform dress for seamen. When the "new Navy" which had been thus created had been established for a few years, it was found safe and feasible to abolish flogging

[1] [The revolutionising of naval education, and the assimilation of officers in the three branches of the service announced in 1902, fall, of course, outside the scope of this chapter.]

as a punishment for ordinary offences among blue-jackets; and although old martinets objected that this leniency would infallibly send the service to the dogs, it is now admitted on all hands that discipline, order, and sobriety have since been at a higher level than ever before. Sobriety, it should be added, was assisted by the cutting down in quantity of the daily ration of rum, the issue of it already mixed with water, and the prohibition of it altogether to those of less than twenty years of age. And the gradual improvement of the food rations was not without a beneficial effect, though it was not carried as far as it should have been, and even in 1885 it remained incomplete.

**The Modern Blue-jacket.**

These and other causes contributed to make the blue-jacket of the third quarter a very different man from the blue-jacket of the first quarter of the nineteenth century. He became clean, neat, orderly, self-respecting, scientific, and, with few exceptions, sober. Rules were made to assist him in remitting home or in saving his wages, and he took full advantage of them. His habitual rowdiness while on shore, and his traditional inclination to take a wife in every port, and to desert all with equal indifference, became characteristics of the past. It was prophesied that whenever any amelioration of the seaman's status was brought about, the class, becoming less rough and hard, would deteriorate as a fighting force; but nothing has ever happened to justify this forecast. On the other hand, events have repeatedly happened to call for the display of cool courage and manly devotion; and the exhibition of these qualities by the seamen of the reformed Navy has been invariably such as would not have shamed the seamen of Nelson's time: so that it may be concluded that the reforms, although they have not perhaps been carried as far as they should be in all directions, have been wholly beneficial.

**Higher Naval Training.**

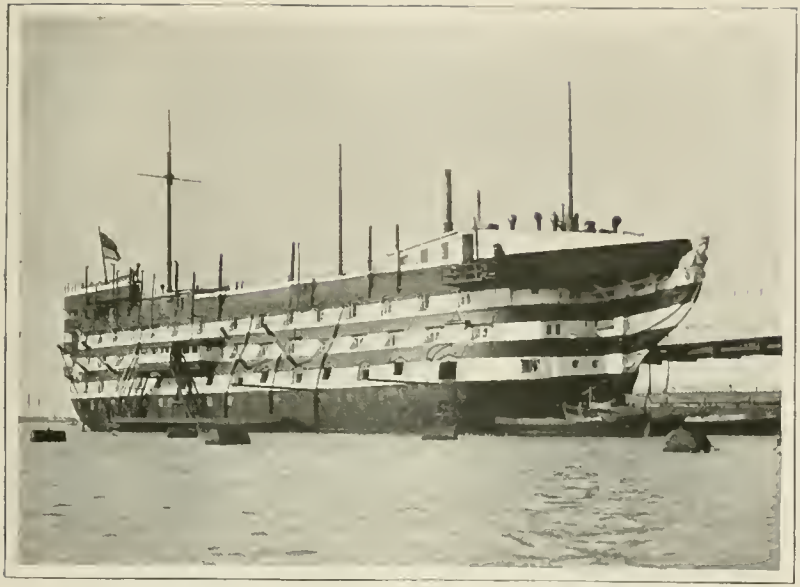
The increasingly scientific character of the naval profession, the improvements in gunnery, and the introduction of the torpedo, necessitated the creation, alike for men and for officers, of special facilities for scientific education, after the preliminary technical knowlege of the profession had been acquired, by the men in the harbour and sea-going training-ships, and by the officers in the *Britannia*, on foreign stations, and in the course of their general preparation for a commission.

The first move in the required direction was made as early as 1832, when the *Excellent*, at Portsmouth, was fitted up as a

gunnery training-ship, and entrusted to the command of Captain (afterwards Sir) Thomas Hastings. All ships which have since fulfilled the same functions at Portsmouth have, in succession, been given the same name; and although the Portsmouth gunnery establishment was at length transferred to the shore, and housed on Whale Island, the officers and men attached to it continued to be borne on the books of a small craft whose name was changed from *Handy* to *Excellent* for the purpose. The corresponding establishment at Devonport has its headquarters in the *Cambridge*, that having been the name of the vessel first assigned to the duty in 1856. Analogous establishments for training in torpedo, mining, and electrical work were created in 1872 in the *Vernon* at Portsmouth, and later in the *Defiance* at Devonport. In all these, officers and men receive instruction and pass through long or short courses, terminating with examinations. Other forms of technical education of an advanced kind are given to officers of all the ranks above and including that of sub-lieutenant, at the Royal Naval College, which has its home in Greenwich Hospital. But although the termination of the period under review found the British naval officer much better equipped technically than in any former age, the methods of his general education were still almost as unsatisfactory as they had been at the beginning of the century. Looking to the nature of the diplomatic and other special services which he is frequently called upon to perform in all parts of the world, this cannot but be regretted. Yet the system which terminates the methodical portion of his general education as a gentleman and man of the world while he is still a mere child renders the result almost inevitable.[1]

Until the nineteenth century the sole reserves of naval *personnel* existed in the ranks of the miscellaneous seafaring population which was not actually serving in the Navy. This population was almost untrained: but, on the other hand, the amount of knowledge and training necessary to make an expert man-of-war's man was not then half as great as it has since become. Ships could, and did, go to sea, even in war-time, with

[1] The system, however, has been given a new lease of life by the new scheme of education announced at the end of 1902, which makes the age of entry even earlier, in order to give time for the technical education necessary to facilitate the assimilation of ranks in the different branches of the service.]



H.M.S *EXCELLENT* AND H.M.S. *VERNON* IN THE EIGHTIES.

*(From photographs by W. Symonds & Co., Portsmouth.)*

Coast-guard and Reserves.

many raw landsmen on board, fight one or more successful actions, and return to port, after a not very long cruise, with a crew which had grown entirely efficient. Yet the system was a haphazard and dangerous one then, and it would have been still more dangerous afterwards. The reserves, in addition to the body of Naval Pensioners, successively created to cope, to some

A REVENUE CUTTER, 1810–1830.
(*Victoria and Albert Museum.*)

extent, with the difficulty, were the Coastguard and the Royal Naval Reserve, with—for the corps deserves mention here, though it did not long exist—the Royal Naval Artillery Volunteers.[1]

The Coastguard grew out of the establishment, necessary in the early years of the century for the prevention of smuggling, of what was known as the Coast Blockade of Kent and Sussex. This was effected by means of a naval force having its headquarters afloat in the Downs and at Newhaven, and having numerous landed parties housed ashore in the martello towers or in special barracks. These parties and stations were commanded by lieutenants. The arrangement lasted until 1831, when

[1] A Royal Naval Volunteer Force was established in 1902.]

1885]

the naval force was supplanted by a body of preventive men with revenue cutters, and by civilians, the whole being then denominated Coastguard. This in time was again supplanted by a body of seamen who had served in the fleet, and who in 1857 were placed under an officer designated the Admiral Superintendent of Naval Reserves. They were periodically drilled and inspected both ashore and afloat, a part going to sea every year for a short cruise, and all being immediately available for naval service. It was always an excellent body of men, but necessarily a small one. To supplement it, the Royal Naval Reserve was regularised by an Act of 1863, and finally established by an Order-in-Council of 1864, though it had then existed in an embryonic form for two years. It was composed at first of officers belonging to the mercantile navy, but subsequently men of the merchant service were also enrolled in it; and it rapidly became numerically considerable. A certain degree of efficiency was originally secured by obliging the members to undergo a given number of drills annually, old vessels being stationed at convenient spots around the coast for the purpose; and, finally, further efficiency was attained by allowing a few officers to enter for temporary service on board sea-going ships of war, this service, properly performed for a year, qualifying them for an annual retaining fee. The Royal Naval Artillery Volunteers were raised under an Act of 1873 from among yachtsmen and landsmen possessed of specified qualifications; but they were disbanded in 1892 (p. 586).

Strength of the Navy, 1885.

In 1885 the total strength of the *personnel* of the Navy, including the Royal Marines and all the reserves above mentioned, was:

| | |
|---|---|
| Officers and Seamen, for sea-service ... | 34,737 |
| Boys, under training ... ... ... | 5,900 |
| Coastguard ... ... ... ... ... | 4,693 |
| Royal Marines ... ... ... ... | 12,400 |
| Various services ashore ... ... ... | 995 |
| Royal Naval Reserve ... ... ... | 19,000 |
| Seamen and Marine Pensioner Reserves | 1,950 |
| Royal Naval Artillery Volunteers ... | 1,600 |
| | 81,275[1] |

The number of vessels in commission on November 1st of the same year was officially returned at:—Ironclads, 30; frigate, 1; corvettes, 26; torpedo-ram, 1; sloops, 16; gun-vessels, 22;

[1 In the Navy Estimates for 1901 the total strength was 131,100.]

gunboats, 48; miscellaneous vessels, 25; despatch vessels, 2; troopships and troop store-ships, 7; Indian troopships, 4; royal yachts, 4; surveying vessels, 5: total steam vessels, 191. Sloop, 1; schooners, 4; training brigs, 6: Coastguard tenders, 19; total sailing vessels, 30. Stationary and drill ships, 37. Grand total in commission, 258.[1]

W. H. HUTTON. The Church.

THE period from 1865 to 1885 is marked by the growing importance of the small body of Roman Catholics in England, caused not by conversions from members of the English Church, nor by any marked increase of immigration from Ireland or abroad, upon which their numbers chiefly depend, but by the energy and public spirit of Henry Edward Manning, sometime Archdeacon of Chichester, who, next to John Henry Newman, was the most eminent seceder from the Anglican Communion. In 1850, when Wiseman had been created by the Pope Archbishop of Westminster (p. 346), a beginning had been made in a new and vigorous assertion of the right of members of the Roman Communion to take their part in public affairs; Manning, with great energy and public spirit, took a still more prominent position than his predecessor. The literature of the day, and notably Disraeli's "Lothair," which is of high value as showing the view taken by one of the greatest statesmen of the period, affords evidence that the Roman policy in England was now regarded as distinctly, and by some as dangerously, aggressive in political as well as religious life. On the other hand, the decrees of the Vatican Council of 1870, which declared the infallibility of the Pope, rendered the severance between the Roman Catholic body and even the most advanced section of those who followed the Tractarians far more deep. It became quite clear to the leaders of the "High Church" party in England that their position had not advanced since the day when Archbishop Laud had written in his diary that approximation was impossible "till Rome is other than she is."

Roman Catholicism.

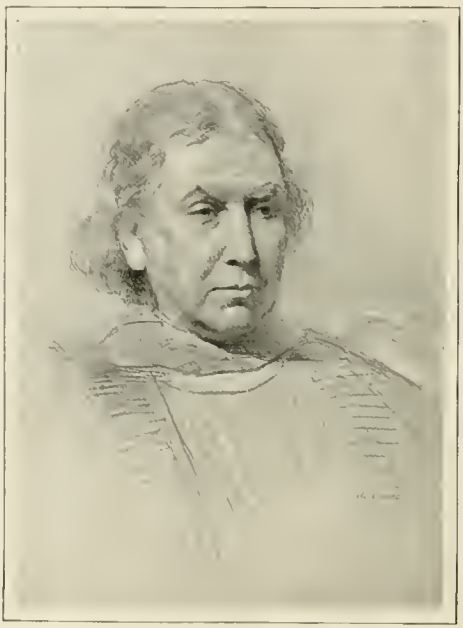
Since 1841 and Tract 90 the Tractarian movement had spread widely, through the influence of laymen and clergy, who, without being partisans, were strongly convinced of the

[1 In April, 1904, the number was:—On active service, 191; Coastguard, drill ships, and special service, 15. The Indian troopships had been abolished, and some of the stationary and sailing ships also.]

importance and truth of its teaching, such, for example, as Mr. Gladstone and Richard William Church, from 1871 Dean of St. Paul's. It led—in the hands of parish priests, who wished to influence their people by the eye as well as the ear, and also of ecclesiastical and antiquarian scholars, who studied with care the text and history of the English Book of Common Prayer and the ancient Liturgies upon which it was based—to a revival of the use of the "ornaments of the Church and of the ministers thereof" which were believed to be ordered by the explicit rubric at the beginning of the Prayer Book, revised and emphasised in the face of Puritan objections by authority of Church and State in 1662. It was clear that this rubric had never been at all widely obeyed, and the special "ornaments" had long fallen into disuse. Thus it was natural that the revival of special vestments for the Holy Communion, and even the use of the surplice in the pulpit, where it had been commonly neglected, should arouse great opposition. It seemed as if those who had been asleep to the significance of doctrine awoke in alarm at "ritual," which was believed to express views to which some were anxious to deny the support of the Anglican formularies. Many cases were brought before the courts; some, in spite of protest, before the Privy Council, to which many of the clergy were unable conscientiously to give obedience in matters ecclesiastical. A Royal Commission issued some valuable but inconclusive reports. Legal decisions, though they were the result of searching investigation and earnest consideration by conscientious judges, seemed to not a few to be ill-informed and even partial. **Ritualism.**

Finally, strong Protestant feeling, misunderstood by leaders both in Church and State, led to the passing in 1874 of a Public Worship Regulation Act, which gave power to prosecute clergy who used unusual ritual, before a lay judge now appointed. The Bill was opposed in both Houses by leaders of lay opinion favourable to the Church movement of the last period, such as Mr. Gladstone and Lord Salisbury, but was supported by the eminent Evangelical and philanthropist, Lord Shaftesbury, and the Archbishop of Canterbury, Dr. Tait, who had been one of the four Oxford tutors who protested against Tract 90 (p. 192). It led to much litigation and to the imprisonment of four clergymen who were unable to accept the decisions of a lay **The Public Worship Act.**

court as binding. It satisfied no one. In 1877 one of the wisest thinkers of the day wrote of the state of affairs which it had brought about: "I can only see in the legal decisions, and in the measures which have brought forth their results in the present crisis, a misuse of law such as has before now been known in history, and a policy of injustice towards an unpopular



ARCHBISHOP TAIT, BY GEORGE RICHMOND, R.A.
(*By permission of His Grace the Archbishop of Canterbury.*)

party, which has, I think, as much to say for itself as any other in the Church, which has done good service to the Church, and which, provoking as it has often been, has had more than parties in English controversy usually have to provoke them." As the years went on the Act was seen to cause friction rather than allay it; its mischievous effect became apparent to the rulers of the Church, and Archbishop Tait at last did his best to discourage its operation. His successors, Benson and Temple, were averse to the prosecution for "ritual" offences of earnest and self-denying men.

Effects of the Oxford Movement.

During this period the Oxford Movement had passed from the academic arena to the world of practical work, and some of the most earnest and successful parish priests in large towns and in London avowed themselves adherents of its principles. It had effected a transformation of the English Church at least as marked as that worked by the Wesleyan movement. It reached, perhaps, its greatest effect in the restoration to dignity and efficiency of the great cathedral church of St. Paul, London, where Milman and Mansel were succeeded by Church and Gregory, men of enthusiasm and power, and a chapter of able and earnest men assisted in making the services, spiritually as well as musically, a pattern of reverence and beauty for all England.

The "Broad Church" School.

But this was by no means the only influence working strongly in the Church during these years. The "Evangelical" School had for a long time, owing to political causes, enjoyed a commanding position among the Anglican hierarchy, and owing to the position won by various bodies of trustees who held the patronage of many benefices, was very largely represented among the parochial incumbents. Scientific discoveries, however, and Biblical criticism, had severely shaken the influence exercised by the theology generally professed by that school. Modifications of doctrine once vehemently preached became necessary; and in this regard the influence of a new school became apparent.

The "Broad Church" party may be regarded in some sense as the successors of the "Latitude men" of the later Stuart days (Vol. IV., p. 572): but they had now a wholly new force. Frederick Denison Maurice, a preacher and thinker of unusual power, though he strongly repudiated the name of Broad Churchman, was really a leader in the movement for a wider view of Christian dogma than had been current among the "Low Church" party. With him were men like the brilliant Charles Kingsley, a popular writer, only superficially acquainted with history, but imbued with a magnificent enthusiasm and a manly and tender religious feeling, and the lawyer, Thomas Hughes, filled with a strong sense of social evils and a determination to meet them in the spirit of Christ. Arthur Stanley, first at Oxford and then as Dean of Westminster, was a champion of the most liberal opinions: and, less prominent, but in the end exercising a wider and more durable influence,

was Benjamin Jowett, Master of Balliol College, who dwelt little upon the positive teachings of the Christian faith, but much upon its ethical principles. The work done by these men was very widely accepted and valued, but they were assimilative and progressive rather than learned or original.

Thus there was work for another school still. History and Biblical criticism had long been mainly in the hands

*Photo: Walker & Cockerell.*

FREDERICK DENISON MAURICE, BY S. LAURENCE.
(*National Portrait Gallery.*)

**Learning in the Church: Bishop Stubbs.**

of German scholars. During the years 1865–1885 it came to be seen that England possessed among her clergy scholars as great, and defenders of the Faith whom no assaults could overthrow. William Stubbs rose from a country cure, through an Oxford professorship, to be Bishop of Chester in 1884. His work during the twenty years before that date had established the constitutional history of England on sure foundations, and had put before the world the historic position and the historic services of the national Church, as they had never been put before. When a Royal Commission was appointed to consider the vexed question of the history, rights, and powers of the

Ecclesiastical Courts, it was his massive learning and strenuous energy which caused the truth, long obscured by common law encroachments and partisan influences, to be clearly set forth. The conclusions of the Commission were ineffectual, and have never been acted upon; but the impressive learning of the appendices contributed by Dr. Stubbs caused the constitutional rights of the clerical estate to be more clearly understood, and

MONUMENT TO BISHOP LIGHTFOOT, BY SIR EDGAR BOEHM, R.A., AND ALFRED GILBERT, R.A.
(*Durham Cathedral.*)

tended to the withdrawal of all official support from the legislation of 1874. Meanwhile, two eminent Cambridge scholars, Joseph Barber Lightfoot (Bishop of Durham, 1879), and Brooke Foss Westcott (Bishop of Durham, 1889), had vindicated the authenticity, and closely illustrated the text, of many of the New Testament books. It was seen that English learning could hold its own in Europe, and that Englishmen were still able powerfully to vindicate the foundation doctrines of the Christian religion. Never since the time when Bull was thanked by the French bishops for his defence of the Nicene Creed had the Anglican body been so rich in great scholars.

New Testament Criticism.

It was of happy augury for the Church that when Archbishop

Two Primates.

Tait, whose goodness had made him as much beloved as his strength of will had made him influential in regard to the political position of the Church, died in 1883, he was succeeded by Edward White Benson, who had already done a noble work as first Bishop of Truro, and who was the bosom friend of the two great Cambridge scholars, Lightfoot and Westcott. He was thoroughly in touch with the modern spirit, while he was an enthusiastic student of the historic past.

Politics and the Church. Irish Disestablishment.

A few words must be said of the political history of the Church during these years. The most important event undoubtedly was the disestablishment and disendowment of the Irish Church (p. 523), which since the Reformation had maintained the closest association with the Church in England. The social influence of the measure, which was not opposed by Archbishop Tait, lay chiefly in the tendency to divergence between the English and Irish Churches which almost necessarily followed. The Bill was strongly combated in the House of Lords by the eloquent William Connor Magee (Bishop of Peterborough, 1868, Archbishop of York, 1891), a great preacher whom the English Church had received from Ireland.

The Burials Act.

In 1880, against the strenuous opposition of bishops such as Magee and the learned and devoted Christopher Wordsworth, of Lincoln, the burial grounds of the Church were thrown open to all persons who should desire to conduct a "Christian and orderly religious service" therein.

The period witnessed the removal of much that had been regarded as the exclusive privileges of the Church. It showed, no less, both at home and abroad, the great increase of her religious influence and her philanthropic effort.

H. D TRAILL. Literature.

In this, the closing chapter of Social England, which brings the history of our Society down to the middle of the year 1885, it has been thought advisable to deal with the subject of Literature in the form of a general review of literary movements and tendencies during the whole period covered by this volume. And this not only because a detailed account of the principal writers who have appeared since 1815 and of their works would, in the majority of cases, involve an attempt to class and determine the position of living men (which, except in the few

A Retrospect, 1815–1885.

instances in which the influence of a writer has passed into history in his lifetime, it is desirable to avoid), but also because the nearer the narrative approaches towards the closing date the more difficult to the point of impossibility does it become to assign to a writer his proper place in relation either to his predecessors or to his contemporaries.

The Three Tidal Periods.

Looking back, then, over the space of seventy years which divides the commencement of this volume from its close, it will be found, we think, without any too fanciful a search after symmetry, to divide itself roughly into three periods, marked successively—though more plainly no doubt at first in poetry than prose, and afterwards in prose than poetry—by an alternating flux and reflux of the literary tide.

The Flow, 1815-1822.

In the year 1815 it was undoubtedly nearing, and between that year and the year 1822 inclusive it touched, high-water mark. Shelley, Keats, Byron, Coleridge, and Wordsworth in poetry; Scott, De Quincey, Wilson, Lamb, and Hazlitt in prose, had all of them reached the maturity of their genius, and some of them the height of their productive powers. This brief period witnessed the publication of Shelley's "Alastor," "Prometheus Unbound," and "Adonaïs"; Keats's "Endymion" and the two immortal "Odes"; Byron's Third and Fourth Cantos of "Childe Harold," the first Two Cantos of "Don Juan," and the finest of his dramas; Coleridge's "Christabel"; Wordsworth's "Duddon Sonnets"; De Quincey's "Confessions of an Opium-Eater"; the first of the "Elia Essays"; some of the best of Hazlitt's work (p. 42); and no fewer than thirteen of the Waverley Novels, including among them the masterpieces of the "Antiquary," the "Heart of Midlothian," "Ivanhoe," and "The Legend of Montrose." Probably no other period of equal brevity in the world's history added so much to the imperishable treasures of its literature.

But with the death of Keats, followed within three years by that of Shelley, and with the gradual decline, not indeed in the fertility of Scott's invention, but in the commanding excellence of his work, we already become sensible that the tide has turned; and, on the whole, the third and (until close upon its end) the fourth decade of the century are years of receding waters. The diminishing ranks of the poets and the depreciated standard of poetic achievement during the interval between the

Two Decades of Ebb.

death of Byron and the emergence of Tennyson—a time when Mrs. Hemans and "L. E. L." were the most popular singers of the day—tell an unmistakable tale. We know now, of course, that the spirit of English poetry was not dead, but only sleeping, and that the broken lyre of Keats was only waiting to be taken up and re-strung with new and richer chords, and tuned to more

WILLIAM HAZLITT, BY JOHN HAZLITT.
*(By permission of William Carew Hazlitt, Esq.)*

varied melodies by the great poet of the Victorian age. But to any man who was then old enough to be able to recall the twenty years of incomparable brilliancy with which the century opened, the outlook in that day of sugared inanities and elegant commonplaces and of "Keepsakes" and "Books of Beauty" must have seemed discouraging enough.

In prose fiction the relapse was less marked, for though between 1820 and 1830 Scott held the field alone, with the beginning of the fourth decade it began to be reoccupied by novelists of high ability and distinction, if not of the first order

of genius, in the persons of Disraeli, Bulwer, and others. Yet even here it is no less true that English literature had to wait from 1814, the date of the publication of "Waverley," until 1837, for another master of the novel, though of a widely different school and temperament, to arise. The authors of "Vivian Grey" and of "Pelham," with all their genuine merits of imagination and showy qualities of literary execution, were but poor substitutes for the "Wizard of the North." When Scott ceased writing, it became no more possible to regard any living and working novelist, than any poet or poetess, as among the foremost representatives of English literature. Its representation had passed into the hands of critics and essayists, and pre-eminently into those of Macaulay, who had already enriched periodical and, as the event proved, permanent literature with his essays on Milton and Machiavelli, on Moore's "Byron" and Croker's "Boswell," to mention these alone: who had indeed already left an impress upon our critical and biographical prose which is still visible, and given it an impulse which is not yet exhausted, and to whose extraordinary influence it is due that in this branch of it, and perhaps in this alone, the history of our literature has run a smooth and uniform course, unbroken by any of those vicissitudes of flux and reflux which are elsewhere to be recorded. From the point of view, in fact, of the historian of letters, the formative work of Macaulay in prose stands side by side with that of Tennyson in poetry as the two most important phenomena of the last seventy years. As regards its effect upon expression—upon the form as distinct from the matter of English literature—the career of Macaulay reduces that of Carlyle to the proportion of a mere meteoric episode.

**Prose Fiction, 1820-1837.**

**The Prose of the Essay.**

The second of the three periods into which the era under consideration divides itself began within a few years of the close of the 'thirties, and lasted a full quarter of a century. From the first work which brought Dickens at a bound into popularity in 1837, to the death of Thackeray in 1863, the tide of great literary production was coming in in splendid strength and volume. It is possible, indeed, to find a period of seven years at about the middle of this quarter of a century which, except in the single article of poetry, would bear comparison with that wonderful septennium of the early

**The Flowing Tide 1837-1862.**

century which has been above described. Thus the years 1846–52 witnessed the publication of "David Copperfield"; of "Vanity Fair," "Pendennis," and "Esmond"; of the first two volumes of Macaulay's "History"; of "The Princess" and "In Memoriam"; of "The Seven Lamps of Architecture"; of "The Latter-Day Pamphlets" and "The Life of Sterling"; of "Christmas Eve and Easter Day"; of Mrs. Browning's first two volumes of "Poems"; and of "Jane Eyre," "Shirley," and "Villette." This list, as has been said, is not so rich in poetry as that with which we have compared it, and, perhaps, even Dickens and Thackeray combined do not more than suffice to balance that astonishing mixture of profusion and perfection which makes Scott victorious over any single competitor save Shakespeare alone. But though the writers figuring in them are in each case nine in number, more varieties of genius are represented in the later than in the earlier catalogue, and many of the above enumerated works are scarcely less sure of immortality than the Waverley Novels, and considerably surer than the rhapsodies of De Quincey and the discoursings of Hazlitt. In fact, no competent judge of literature could possibly, we think, ignore the manifold evidences of a turn of the tide having set in at about the date of Queen Victoria's accession, and having reached its flood about midway in the first decade after the completed half century.

**A Paradox of Popular Taste.**

When, however, we are about to claim 1837–63 as another "great period" of literature, and to class it in imagination with those two other great periods, both also so curiously occurring in the reigns of our two other female sovereigns—the Elizabethan, and the so-called "Augustan" age of Anne—we come across certain "stones of stumbling" which were either absent from the path of the critic in the two eras referred to, or of which the very memory has disappeared. There is at least no evidence to show that when Shakespeare and the other great dramatists and lyrists ruled, in the late sixteenth and early seventeenth century, or when, as at the beginning of the eighteenth, Addison and Steele and Pope and Swift were the admired and honoured leaders of the national literature, there flourished side by side with them one or more writers of vast inferiority to these great men, but of quite as wide, if not of wider, celebrity, and commanding a "paying public"

of a numerical magnitude to which the admirers of Shakespeare and Ben Jonson, of Pope and Addison, never at their most successful moments approached. If any such fortunate impostors existed in these periods their very names are lost to us. Poetasters and prose twaddlers no doubt abounded: but not with money. The "poor devils" worked "for the booksellers" at a pittance, and Pope had the satisfaction not only of lashing their literary incompetence but of jeering at their rags. What he would have thought and felt, and how he would have given expression to his feelings, if one of the tenth-rate scribblers whom he scarified in the "Dunciad" had written a book which maintained the highest vogue for a generation, passed through forty editions, and brought the author twenty thousand pounds, one shrinks from the mere attempt to conjecture.

*Photo: Russell & Sons, Baker Street, W.*
MARTIN FARQUHAR TUPPER.

**Proverbial Philosophy.**

Yet it is with almost as strange a portent as this that the literary history of the century confronts us. For though it would in many respects be unjust to compare Martin Farquhar Tupper (1810–89), a man of education, refinement, and amiability, with the ignorant and disreputable crew whom Pope pursued with a brutality as shocking as their own, yet it is hardly an exaggeration to say that his claim to be regarded as a poet—and it was as a poet that he presented himself to, and was apparently accepted by, a large body of his countrymen—was little less preposterous than theirs. Tupper could, and did, occasionally, acquit himself respectably as a writer of ballads and other kinds of minor verse, but it was not to these he owed his popularity. This was due to the extraordinary collection of rhymeless and, indeed, rhythmless platitudes which he published under the name of "Proverbial Philosophy," which was eagerly taken up

by the public, and was in immense demand as a "gift-book" for a long series of years. There were those, indeed, who declared, and not wholly in an ironical spirit, that its purely material and external attractions, its conveniences in shape and size, combined with the unimpeachable propriety of its contents—that these and not any popular delusion as to its literary merits were the operative causes of its truly astonishing, and its yet more astonishingly prolonged, vogue. But no such explanation will entirely account for the fact. The public taste in bookbinding and book decoration is liable to all the vicissitudes of fluctuating fashion; and in all ages the supply of platitudes, whether in concealed or in avowed prose, has always been large enough to prevent any single purveyor of them from establishing a monopoly. It seems, therefore, impossible to doubt that Tupper's lasting attraction for so large a body of his countrymen must have been mainly an attraction of form and not of matter, and that they must have read and admired him in such numbers not merely because he uttered correct sentiments, but because his manner of uttering them struck his public as beautiful and distinguished. The vast and steady popularity of the author of "Proverbial Philosophy" during the greater part, if not the whole, of Tennyson's prime, and still more, the unquestionably immense numerical preponderance of the poet-aster's public over the poet's, is one of the most singular phenomena of that literary era.

**The Second Ebb in Poetry**

Its chief significance, as we shall have to point out later on, resides in the fact that the period of its appearance coincided with a flow of the literary tide. It was while Tennyson was adding to his triumphs, while Browning was slowly approaching to that wider recognition which he cannot be said to have achieved until the publication of "The Ring and the Book," that this many-headed prostration before the commonplace was going on: nay, it lasted up to and over the date when the sudden and startling apparition of Mr. Swinburne was to add a new name to the list of great English poets, and at the same time to strike English poetry for the better part of another quarter of a century with sterility in all save imitative production. From the early 'sixties till almost the middle of the last decade but one of the nineteenth century

the influence of Swinburne, waning towards the end of the period, but still perceptible, dominated all the younger poets of the later Victorian era; and it is only now, when it is almost, if not quite, exhausted, that an original note is beginning to make itself heard. During the 'seventies and 'eighties, however, we have to note another poetic influence, issuing indeed from the same Romanticist sources of inspira-

*Photo: Elliott & Fry, Baker Street, W.*

ALGERNON CHARLES SWINBURNE.

tion, but slightly divergent in its course. The poetry of Dante Gabriel Rossetti (1828–82) had far less widely captivating power than that of Swinburne; probably it affected but one young writer to five who came under the influence of the author of "Poems and Ballads." Still it diverted attention from the musical to the pictorial side of poetry, and so tended to substitute one form of imitative composition for another. But it would be hardly too much to say that for full twenty years after the Swinburnian note was first sounded in the public ear, little else but its echo was to be heard in the strain of any younger singer. During these two decades almost all original poetic impulse seems to have disappeared from among the literary youth of England.

Decline of the Novel.

In prose fiction, too, during the self-same period there was a notable, and as it seems to some of those who now look back upon it, almost calamitous decline upon lower ideals.

Thackeray died in 1863; and though Dickens was still alive and went on writing for another seven years, all his best work was done. Of Charles Reade and Charles Kingsley much the same might be said. The two finest romances of

DANTE GABRIEL ROSSETTI.
*(From a photograph by Lewis Carroll.)*

the latter were written in the 'fifties; the former's greatest novel, "The Cloister and the Hearth," in 1861. The last of George Eliot's indisputable successes, "Silas Marner," appeared in the same year, and there remained but one work which is even arguably worthy of her genius, the brilliant but unequal "Middlemarch," to be added to her record. Even Wilkie Collins (1824–89), a novelist usually described as of the school of Dickens, though he possessed few or none of the master's gifts save a certain command of the weird and terrible, had woven the most successful of his mystery plots. When the first of the two decades had run little more than half its

course, the next ten or twelve years may be described with substantial accuracy as the period of the unbounded vogue and popularity of Anthony Trollope (1815–82), a writer who followed Thackeray in the systematic confinement of his studies to the "comfortable" classes of society, but who has nowhere displayed the faintest traces of Thackeray's subtle humour, his genuine though restrained pathos, his unrivalled insight into character, or his admirable prose style. Within certain narrow limits—those, for instance, of the cathedral close—Trollope was not without an eye for character, and he has portrayed certain naturally humorous types to be found within these limits with a fidelity which in itself assures for them a humorous effect; but speaking generally, his art, in its mechanical realism, stands related to Thackeray's as that of the cheap photographer to the masterly portrait-painter's. It is the commonplace carried to its highest power; and the fact that for so long a series of years he stood unquestioned at the head of his branch of the literary profession and commanded a public so large that the amount of his professional earnings was for his day unprecedented, affords a phenomenon almost as discouraging in itself as the reign of Tupper in another field of literature. Indeed, if it would be unjust to the novelist to treat the two instances as precisely parallel, it is only because, vast as may be the interval which divides the third-rate in prose fiction from the first-rate, the difference between the poetaster and the poet is one not in degree but in kind.

CHARLES READE.
*(From a water colour by Mdlle. Stefanofska, in the possession of C. L. Reade, Esq.)*

It is somewhat unfortunate and not a little unfair to this branch of our social history that we should be compelled

The Literary Revival.

to close this review of it during a period of temporary retrogression, or, at any rate, of temporary pause. But it does so happen that that stir of new forces in our literature, which will be denied by none but those who have been, perhaps, pardonably disgusted by daily exaggerations of it, only began to be felt about 1880. During the fifteen or sixteen years which have since elapsed[1] its effects have been most marked in almost every department of letters. For, if it be true, as no doubt it is, that neither in poetry nor in prose fiction, nor even in history, in biography, or in the essay, can we as yet, with any confidence, indicate the successors of the deceased masters of these various literary forms, it is, at the same time, equally true that the claimants to a place very near the highest have never been so numerous nor their claims anything like so strong as they are to-day. If some critics are slow to recognise this, their hesitation is probably due to one or other of two causes. Either they have been so far irritated out of their own critical impartiality by the extravagant *réclame* of newspaper writers who find a second Shelley or another Keats every alternate week, as to deny the existence of any new poetic genius whatsoever; or else they have been really prevented by the immense elevation which has taken place in the average standard of verse-making during the period in question from being able to discern among the host of new-comers the pre-eminence of a few. Yet they are there, and there of their own right; more than one or two of them with a manner of their own, and no longer, as had been the case for the previous twenty years, mere echoes of Tennyson or Swinburne, mere mimics of Browning or Rossetti. If the great poet of the coming century has not yet appeared, the mere number of genuine poets whom the closing century has produced need not discourage hopes of his appearance.

The New Romance.

The romantic movement in fiction, except in so far as it is a mere reaction from pessimistic realism, is again a sign of reviving strength. And it is a fortunate circumstance for the future of literature that its leader and foremost representative should have possessed the distinguished literary gift of Robert Louis Stevenson (1850–94), a writer whose

[1 This was written in 1896. Mr. Traill died early in 1900.]

exquisitely finished style, while for the reader it suffers somewhat from its evidences of too conscious art, affords for that very reason an all the more inspiring and serviceable model to the student. His influence is largely traceable in all the lighter literature of the imagination at the present day, and, due allowance being made for the dangers which beset all young

*Photo: Walker & Cockerell.*

ROBERT LOUIS STEVENSON, BY SIR WILLIAM BLAKE RICHMOND, R.A.

(*National Portrait Gallery.*)

writers still in the imitative stage, it has been on the whole an influence for good: while the prose of essay and criticism which had sought, perhaps, an excess of point, precision, and emphasis under the long-continuing and only now declining domination of Macaulay, has—thanks in part to the unparalleled power and fascination of John Ruskin, the successor to the tradition of Landor, De Quincey, and the other early nineteenth-century masters of the rhetorical and "impassioned" prose style—acquired a colour and flexibility, and an adequacy of response to emotional and æsthetic

needs, in which for more than a generation it had been lacking. In every field of literature, in short, the endeavour after literary correctness, literary grace, and, if possible, literary distinction, is conspicuous and increasing. The impulse has extended even to the drama, which for more than half a century had lived in contented divorce from literature, and even before that period had been able to effect no closer or happier union with it than is recorded in the respectable, but absolutely undistinguished, productions of Sheridan Knowles (1784–1862), and the deftly constructed but showily rhetorical dramas of Bulwer Lytton. Our leading dramatists of to-day are nothing if not literary, at any rate in aspiration and purpose, and are, some of them, avowedly committed, with what success we have yet to see, to the undertaking of regaining for the English drama a position in English literature of equal consideration with that to which accomplished writers like Augier and Dumas the younger have raised French drama in the literature of France. This, however, is but one among many signs of the universal eagerness for literary acceptance and recognition which is one of the most striking characteristics of the age, and which the immense development of the cheap newspaper press and its largely increased attention to literary things and persons have provided with the means of gratifying itself in far too many spurious, pretentious, and ridiculous ways. But it is the duty —though the difficult duty—of the critic of literature and the student of its history to endeavour to discover, and measure the extent of, the reality which underlies this somewhat rank overgrowth of sham: and our belief is that those who address themselves with patience and without prejudice to this task will find that, on the whole, it yields them not merely satisfactory but highly encouraging results.

Later Victorian Drama.

F. G. STEPHENS. Later Victorian Artists.

In one respect, to which, perhaps, not sufficient attention is usually given, Pre-Raphaelitism was remarkable. It was really the one which in this country tended to the formation of a school in the historical sense of that term, as it is applicable to Roman, Florentine, Low Country, German, and modern French painting. Here, in fact, was a group of men of genius,

JOHN RUSKIN, BY HUBERT VON HERKOMER, R.A.

*(By permission, from the portrait at the National Portrait Gallery.)*

who, however diverse they might be, acted according to a common impulse. Of no other congeries of English artists can this be said. In the course of a few years, too, the group became the centre of a very important company of artists, each of whom was, as the members of the Brotherhood began and continued to be, perfectly independent. In respect to time and his early death, the first to be reckoned in this numerous rank of more or less eminent and original painters was Walter Howell Deverell, a youth of extraordinary promise, much beloved by the Pre-Raphaelite Brotherhood. Far more developed was Mr. Arthur Hughes, whose delightful "April Love" is one of the few examples fit to be ranked with Millais's "A Huguenot" and "The Order of Release," and is instinct with exquisite sentiment. Mr. Henry Wallis's "Death of Chatterton," "The Stone-breaker," and a host of pictures in water-colour, proved him to be an artist of very rare accomplishments and sympathies. The next in the order of time who was a confessor of the same order was G. P. Boyce, whose "The Confessor's Chapel," "Bridewell," and "Where stood Bridewell," delight all eyes, and charm those whose sense of beauty does not need to be aroused by startling effects and gorgeous coloration. Subtle, delicate, and demure, the art of this painter will endure. The brilliant, solid, and powerful seascapes of John Brett qualified him to be Neptune's Painter in Ordinary, while Mr. Hook and Henry Moore have shown the world more of the splendour and beauty of the ocean and its shores than was ever known before. But, however true to nature the latter two great artists may be, they cannot, in the ordinary sense of that designation, be called Pre-Raphaelites. W. J. Inchbold's art never obtained the recognition its merits, expressiveness, and delicious harmonies of tint and tones demand, and which it will some day receive. His "Lake of Geneva" might have been painted by the king of Faëry-land. A more fortunate and resourceful poet-painter was Alfred William Hunt (1830–96). Mr. J. G. Naish, C. P. Knight, and half a dozen less known land- and sea-painters deservedly hold high places in the ranks of naturalistic landscapists, one of whose aims it is to infuse the fidelity and vigour of their works with sentiment of the higher and less obvious sort. J. W. Oakes depicted Welsh mountains

**The Resultants of Pre-Raphaelitism.**

and valleys with a profound sentiment which is not "classical," nor in the manner of John Varley, Turner, or any other master; his work excels in brightness, research, and precision. A confessor, it might be said an early martyr, of Pre-Raphaelitism is Mr. W. S. Burton, who, in 1856, gave the world an austere and original tragedy called "The Puritan," which represented a dying Cavalier after he has been wounded in a duel.

Insomuch as his antetype and model in art was Millais

HOME WITH THE TIDE, BY J. C. HOOK, R.A.
(*National Gallery of British Art.*)

no less a person than Frederick Walker might be enrolled with the distinguished group of men we are now discussing. Notwithstanding the vulgar notion that Pre-Raphaelitism and high stippling were one, it is impossible not to call Walker's "Boys Bathing," "The Harbour of Refuge," "Fishmonger's Shop," "Philip," and "The Ploughman" most brilliant, happy, powerful works of that order which includes Millais's masterpieces in figure- and landscape-painting. With these, too, must be ranked Mrs. Allingham's for ever charming "A Flat Iron for a Farthing," which either Walker or Millais might have produced, and half a score more of fresh and fair illustrations of rustic life. Mr. W. Gale

Frederick Walker.

had joined the company we speak of with several capital pieces, the best of which is "Mr. F.'s Aunt." One of the most splendid and highly endowed poet-painters of the Victorian Age was Rossetti's analogue, Sir E. Burne-Jones (1833-98), the artist of "The Golden Stair," "King Cophetua," "Love among the Ruins," "The Sleeping Beauty," and a host of lovely and mystical pieces. Mr. Spencer Stanhope's art

THE VAGRANTS, BY FREDERICK WALKER, A.R.A.

(*National Gallery of British Art.*)

allies itself with Rossetti's, and his picture of "The Wine-Press," a parable of Christ, not unworthily occupies a place among the finer achievements of Rossetti, Mr. Holman Hunt, and Sir E. Burne-Jones, with many of which it has something in common, and yet is independent, potent, and original.

**Other Groups: Gilbert, Watts, Brett, Hook, Moore**

Leaving this original and finely equipped group, most of whose names are already written in capitals upon the rolls of fame, let us recall to the memories of all who delight in art, and are just, catholic, and sympathetic enough to give honour wherever honour is due, a still more numerous and varied, as well as a highly accomplished and able, category of men, who in whatsoever country they had lived and laboured, or in

LOVE AMONG THE RUINS, BY SIR E. BURNE-JONES.

*(From a photograph by Mr. F. Hollyer of the picture as originally painted.)*

whichever age their distinctions had been won, would have deserved our gratitude and the world's applause. His ever-abundant invention, mastery of design, and rare power in painting compel us to give Sir John Gilbert the first place in this splendid company. Of quite another stamp, but worthy to be ranked with the greatest portrait-painters of all time, was G. F. Watts (1817–1904), some at least of whose noble and ambitious allegories are pre-eminent in their way, while, strange to say, the same master excelled in humour when he depicted how the first oyster-eater fared under the eyes of his admiring yet fearful spouse; the pair of aborigines being seated, naked of course, upon the sea-shore. Who shall think of sea-painting and not remember Mr. J. C. Hook, the Titianesque master of our time who immortalised himself with "Luff, Boy!" and "The Broken Oar"? To the sea we must return again when we remember that it was John Brett who painted the resplendent "Britannia's Realm." If Henry Moore (1831–96) had produced "The Newhaven Packet" and nothing else, how great would have been our debt to him! Apart from this we owe to this master of cloud-land and ocean's phases and passions the superb "Loss of a Barque in Yarmouth Roads," "The Last of the Light," "A Winter Gale in the Channel," and "Rough Weather in the Mediterranean," to say nothing of great numbers of almost equally fine examples in oil- and water-colours. The brothers Wyllie, if not Pre-Raphaelites *de facto*, are, each in his line, of the best grade. No one but the elder of the two has attempted to paint the bottom of the sea; no one has depicted summer sunlight on a flowery meadow with so much tenderness and truth as the younger.

**Leighton, Burton, Poynter.**

Among the finest eclectic masters only M. Bouguereau, the French leader in that line, can, technically speaking, take a place near Lord Leighton (1830–96), whose "Syracusan Brides," "Venus Disrobing," "Wedded," two newly married lovers; "Daphnephoria," and "David," are but the finest and most complete, the most elegant, animated, and refined, of a long series of examples, which only the ungrateful and half-taught will venture to call academic, or describe as over-laboured and excessively polished. The antithesis of Sir John Gilbert, Mr. Holman Hunt, and other dramatic, and in painted prose moralising, artists, Leighton thought of beauty, and was satisfied with nothing less; just as

Millais thought of nature and life, which, when wholesome, is never less than beautiful. Sir F. Burton (1816–1900), another eclectic of a high degree and sparse productiveness, takes a place in line with Leighton. Not far remote from them, with a dash of austerity and abundance of learning, energy, and grace, comes Sir Edward Poynter, whose "Atalanta's Race," "Suppliant to Venus," "Israel in Egypt," and, best of all, "Venus's Visit to Æsculapius," which is at the Tate Gallery, are masterpieces to be enjoyed wherever culture and chastened art obtain.

Midway between Poynter and his antitheses, H. S. Marks and Mr. Frith (whom, of course, no one would care to compare), the student will group a body of incident and anecdote painters, some of whom incline to humour, some to pathos, some to sentiment, some to character, some to costume, and some to idyllic poetry. John Philip (1817–67) was a leader of this sort, good in nearly all the lines here named; his "La Gloria" is a tragi-comedy, his "Murillo" an "illustration," his "Free Kirk" and "The Catechism" are, in their designs at least, almost worthy of Wilkie at his best; and his "Chat Round the Brasero" is a capital piece. Calderon's finest production of late years was "Ariadne lorn of Theseus," which was in the Academy in 1895. "Her Most High, Noble, and Puissant Grace" was a gem of a fine and charming kind; nor was "On Her Way to the Throne" unworthy of so excellent a taste as his. As a brilliant painter Calderon (1833–98) might be compared with Pettie, when Pettie was at his best, not otherwise, and with Mr. Orchardson, although he is not nearly so great in the sardonic vein in which the latter triumphs when he appears as the Michael Angelo of cynical and pathetic anecdote painting. As a master of humour, Marks (1829–98), when he does not labour his points too much, is very welcome; but to his "Three Jolly Post Boys" his immortality will be due. T. Faed (1826–1900) will remain eminent as a painter proper apart from the pathos of his best efforts, which are "From Dawn to Sunset," "The First Break in the Family," "His Only Pair," "Baith Fether and Mither," and some later exercises in the same line. Renowned among modern painters of anecdote, history, romance, costume, and beauty, Sir Laurence Alma-Tadema, who, if not of it, is in the English school, stands on one of the loftiest pedestals. A hundred pictures call him great, and leave his critic at a loss in which category to place so resourceful a designer, so

Philip, Calderon, Marks, Faed.

learned and acute an observer, and so admirable a master. Apart from paintings which delighted Continental Europe before he came among us, the superb inventor of the "Danse Pyrrhique," "*Fête Intime*," "Tarquin," and "Death of Prætextatus," has given us "*Un Amateur Roman*," "Phidias at the Parthenon," "An Antique Sculptor," "The Picture Gallery," "The Sculpture Gallery," "Water Pets," "An Audience at Agrippa's," and quite a host of similar specimens, any one of which would go far to win the reputation of an artist.

Fildes, Leslie, Briton Riviere.

It is difficult to place Mr. Fildes, whose "The Doctor" is a true *chef-d'œuvre*, as full of purpose and excellent painting as of pathos. Equally difficult it is to decide how the future will find where Mr. G. D. Leslie's statue shall stand; among those of the rustic, pathetic, or anecdotic painters it is sure to hold a high position. The distinction of Mr. Briton Riviere will be decided by "The Magician's Doorway," "Actæon," and "Persepolis," if not by "Phœbus Apollo" and some of his delightful "dog-pictures." He is a friend of the canine race, and, as such, quite as great, though in a very different way, as Landseer himself. In this indeterminate category of artists, to whom the English world owes so much, it is right to put George Mason, who excelled in poetry as well as in designing. A very choice idyllic spirit often rules in the landscapes of Mr. David Murray, who, when he does himself full justice, demands a very rare and noble sort of distinction, while he is a sympathetic observer of nature. Professor Costa and Corbet are twin stars of eclectic landscape painting of the highest class; they are not remote from Mason, and if, like him, they painted English subjects, the likeness of any one of the three to the others would be more obvious than it is. That Mr. Walter Crane is a master of decorative art has not prevented him from giving us some very precious quasi-classical exercises upon romantic and chivalrous themes. Sir James Linton must not be omitted when learning, care, and a fine pictorial sense are under consideration. He is one of the best draughtsmen England has produced.

Crane, Linton.

Whistler.

It was Whistler's misfortune rather than his fault that no less a portent than the so-called Impressionism is, artistically speaking, his illegitimate offspring. Not, however, to this fine and original artist—a rare colourist, a delicate master of the etching-needle, and, as a chiaroscurist, not easily to be sur-

A VISIT TO ÆSCULAPIUS, BY SIR EDWARD JOHN POYNTER, P.R.A.

(*National Gallery of British Art.*)

(*By permission of the Berlin Photographic Company, 133, New Bond Street, London, W.*)

passed—are due the preposterous fads and vagaries represented at the exhibition of the New English Art Club; not on Whistler (1834–1903) are to be fathered the crude and audacious vulgarities of MM. Degas and Manet, and their feeble English imitators. When Time, the avenger of common-sense, has brushed away the monstrosities of this new avatar of presumption, ignorance, and incompetence, then will it become apparent that, though in moods the most diverse and unequalled, every modern English artist of renown may be grouped with one or another of three distinguished men, whose names will survive as Sir John E. Millais, Dante Gabriel Rossetti, and James McNeill Whistler. The first was an Englishman complete, who had, practically speaking, never been out of his native country; the second was an Italian of the sixteenth century, born in England and tempered by English ways; the third, and not the least original, though far more limited, artist of the trio, is a Parisian of the later days who happened to be born in one or other of the States of the North American Union, and can hardly be said to have come under the influences of ancient art-culture at all. That he, Lord Leighton, and Sir E. Burne-Jones belong to the same generation of artistic mankind will sorely puzzle future historians of painting.

MAY MORRIS. Decorative Art, 1800-1885.

At the beginning of the century the decorative arts present a mixture of pompous pseudo-classicism—a Renaissance of the Renaissance, a degenerate ghost of a borrowed style with the superficial and trifling rococo of the eighteenth century; while there lingered a remnant of spontaneous and almost unconscious ornament applied to those wares, made rather for domestic use than for trade, which had escaped as yet the growing machine industry. Interesting as must be the last vestige of the popular art which at its best and strongest period covered France, England, Italy, and Germany with architecture and ornamental work, whose remains are at once our delight and our shame, this homely side of belated eighteenth-century decorative design has its own not very characteristic prettiness, its faint odour of romance—the romance of blue china and faded roses—and, compared with the complete negation of beauty in ornament of the late Georgian and early Victorian

THE ARTIST IN HIS STUDIO, BY JAMES McNEILL WHISTLER.

*(By permission of Douglas W. Freshfield, Esq.)*

Lingering Traditional Ornament.

periods, it is charming indeed. In such homely decoration the less wealthy classes expressed something of their need for beautifying life. We cannot wonder, recalling the events that have built up the century, that every form of ornamental handwork soon began to decay. The use of machinery not only intensified labour, but where for decorative purposes it has been substituted for the craftsman, it has lowered the standard of taste until, in the end, the handworker himself is driven to copy the work of a machine.

Art and Industry.

Early in the century public men were concerned at the growing estrangement between art and industry; only they not unnaturally mistook the effect for the cause: they saw only the deterioration of the art and not the causes which had made intelligent art impossible. Their national pride was hurt: England, first of industrial countries, should also be first in the arts. And they came to the conclusion that the designers and draughtsmen must be looked to, their artistic education enforced; they talked of the "Union of Art and Industry," a common-sense union—Art the handmaiden, Industry the master. At last their doubts and misgivings—voiced now by a politician, now by a manufacturer—crystallised in a Special Committee of the House of Commons (1835) "to inquire into the best means of extending a knowledge of the Arts and of the principles of Design among the people, especially the manufacturing population of the country; also to inquire into the constitution, management, and effects of Institutions connected with the Arts."

Schools of Design.

One gathers from the report of the Committee, reappointed in 1836, evidence of the popular attitude towards art. The Committee came to the conclusion that "it was most desirable that the principles of Design should form a portion of National Education." A vote of £1,500 for a normal school of design was passed, its expenditure being placed in the hands of the Board of Trade. In 1837 the first Government School of Design was opened at Somerset House with twelve pupils, the modest forerunner of the present Royal College of Art at South Kensington, as of the quite inestimable historic collections of the Museum itself. The plan of study was in bare outline very much what it is to-day, however much the instruction itself may have altered. To the ordinary drawing-school

routine was added instruction in design for branches of industry—(*a*) study of fabrics and of conditions of processes admitting of design, (*b*) study of the history of the arts in manufacture, styles of ornament and "such theoretical knowledge as was calculated to improve the student's taste and add to his acquaintance with art." Local schools were formed in the manufacturing districts, the first at Spitalfields. They soon became unpopular, and, owing to the dissatisfaction they caused, a Committee of the House of Commons was appointed (1849) to inquire into the management of the Government school at Somerset House. In 1852 a Department of Practical Art was formed, all the schools in the country being placed under its management. In 1853 the London school moved to Marlborough House, and thence to South Kensington in 1857. The unpopularity of the system is not surprising; it should have been foreseen that a designer of artistic instincts and artistic training cannot be turned out to order, machine-made, well-calendered and finished, like a bale of Manchester cotton. The disappointment expressed at this obvious negative result is curiously mixed with a dread of change, thrusting back as idealistic and unpractical a new train of ideas not strictly in the line of machine-development No doubt the complaints that the school-instruction was incomplete and unsystematic were well-founded, nor could it well be otherwise. It is always difficult to decide what, in a movement involving anything beyond the material necessities of life, is artificial, and what a spontaneous expression of the need of the time. We have so many centuries of historic art behind us that an indolent or unimaginative brain, merely borrowing from the past, may produce work which a public grown too hurried to criticise accepts as original. When we see, as the result of Special Committees, Schools of Design, and Museums of Historic Art, the enormities of the Exhibition of 1851, the monumental dulness of that of 1862, and even the trivialities displayed in our West-end shops at the close of our period, it cannot, we fear, be said that the effort to unite the arts and manufactures of the country met with any rapid or universal success.

During the first half of the century manufacturers had been contented to copy French designs; the great idea, even

French Influence.

of those who were endeavouring to create an English school, was at once to emulate French skill and to be independent of it. Some of the manufacturers examined by the Committee of 1836 declared that the figured silks of Spitalfields were copied from French designs, "as they were almost destitute of taste in England." The designers, too, of Paisley shawls were chiefly occupied in arranging and copying from "French" cashmeres.

The questions asked by the Committee show how confused were the notions of decorative art entertained by the average member of Parliament in those days. "Have not the French lately devoted their attention to a style which they call the Renaissance, or the early style which prevailed in Italy when the arts began to dawn?" This is a typical leading question. A Royal Academician read to the Committee a paper on Design (he called it a "Lecture on the Oval"), which introduces the subject in these promising words:—"By a concatenation of ovals . . . an agreeable range of lines is produced." He then proceeded to show that if once a workman had the idea of the oval in his mind he could never make a badly-shaped vase.

"Gothic" Art.

Early in the century the first signs of the "Gothic revival" (p. 238) sprang up, a movement which, directly and indirectly, has left its mark equally in architecture and in ecclesiastical and domestic decoration. For us whose ideas as to the value of revivals and imitations of dead schools have changed, it is difficult to distinguish what in it was genuine love of Gothic art and what mere grotesque travesty. It was to be expected that a desire should arise for something more vigorous and distinctive than the Louis Quinze and the classical style, with its "five orders," that had so long held their ground; but the expression of this desire—in church-spires soaring above the roofs of a gentleman's country-house, in miniature castles complete even to the dungeons, in shoddy sentiment through which nakedness of invention is apparent—was as naïve and inconsequent as the "Mysteries of Udolpho" in literature, or Horace Walpole's Gothic villa in architecture, and equally unconvincing in its attempt at reproducing old-time romance.

It has often been said that to revive a period of art that has passed away is as impossible as to revive the conditions under which that art was produced. Nor is there any

mystery in the want of success in the "Gothic revival" in its earlier or later developments. Medieval art could be caricatured, but not reproduced. It was free, leisurely, individual, wayward, too—arising out of a way of seeing life and out of a belief in the unseen that are quite outside the habit of modern thought. A nation which has to a large extent lost the power or the desire to produce work of great beauty loses therewith the faculty of criticising and appraising such beauty when they meet with it. The strange and varied richness of imagination manifest in Gothic work is to them an exhibition of savagery: it is too far-off, too incomprehensible in its apparent simplicity to touch any chord in their sympathy.

The popular criticism of this revival of medieval art is expressed by James Fergusson the architect:

"The great recommendation of Gothic Art is that it is so rude that any journeyman can succeed in imitating it; and they have done so till all our grand old buildings are clothed in falsehood, while all our new buildings aim only at deceiving.

"Thirty or forty years ago, if you entered a cathedral in France or England, you could say at once, 'These arches were built in the age of the Conqueror—that capital belonged to the earlier Henrys.' . . . Now all this is changed. You enter a cathedral, and admire some iron-work so rude you are sure it must be old, but which your guide informs you has just been put up by Smith of Coventry. You see . . . some painted glass so badly drawn and so crudely coloured it must be old—Jones of Newcastle."

Augustus Welby Pugin, the best-known of the second generation of Gothic revivalists, aimed at reproducing the medieval church in its entirety, with all its mural paintings, hangings, altar-vestments, embroideries, brasses, tiles, etc. To that end he found himself obliged to inspire the manufacturers with whom he came in contact with something of his own enthusiasm, or to establish workshops to carry out his own ideas. His father, A. C. Pugin, had been a pupil of Nash the architect; in passing, it may be noted that George IV. had sent his *chef* to him for instruction in drawing and design, with a view to the æsthetic adornment of his dinner-table. A. W. Pugin's enthusiasm and admiration for Gothic art were genuine; he felt the logic and beauty of its construction and ornament, and was interested in all its detail. With his head full of

**Pugin.**

the work of the thirteenth and fourteenth centuries, he designed and produced gold, silver, and copper work, embroideries, stained glass, etc., for ecclesiastical uses, besides wall-papers and tiles and other things for domestic decoration "in the medieval style." For all this, he failed to catch the temper of the period he genuinely loved and admired, and his work is lacking in grace and distinction. His appreciation of himself

ST. AUGUSTINE'S CHURCH, RAMSGATE.
(*Built by Augustus Welby Pugin.*)

in 1850—he died a few years later, still young—is strangely pathetic, reading into it, as one must, the implicit admission of some weakness to which his failure as an artist was partly due.

"I believe, as regards architecture, few men have been so unfortunate as myself. I have passed my life in thinking of fine things, studying fine things, designing fine things, and realising very poor ones. I have never had the chance of producing a single fine ecclesiastical building, except my own church,[1] where I am paymaster and architect; but everything else, either for want of adequate funds or injudicious interference and control, or some other contingency, is more or less a failure."[2]

[1] St. Augustine's, Ramsgate. [2] Remarks on articles in the *Rambler*, p. 11.

To confess that external conditions are too much for him is an admission of weakness; a stronger man would have realised his conceptions in the work he had to do.

If the Great Exhibition of 1851 is to be taken as the expression of all that is best in the artistic efforts of the mid-century, they must be ranked extremely low. We see in all the excitement and wonder over the "Palace of Glass" that curious idealisation of the commonplace in which people indulge to whom the æsthetic side of life is unstudied and unknown. They rhapsodised over the crystal fountain, describing the delicate, fairy-like structure and the sun's glitter through the falling water-jets. Chaucer himself is pressed into service :—

> "I dreamt I was
> Within a temple made of glasse"

is made prophetic of this modern glimpse of fairyland—a fairyland decorated by Mr. Owen Jones "in the three primary colours."

"The Great Exhibition of the Works of Industry of all Nations, 1851," was an inspiration of Prince Albert and the Society of Arts, and the outcome of the yearly exhibitions begun in 1847 with a view

THE GREAT EXHIBITION OF 1851, BY GEORGE WALLIS.
(*Victoria and Albert Museum.*)

The 1851 Exhibition.

to establish a "quinquennial Exhibition of British Industry." In spite of the chorus of praise lavished on it, it was seen that on the artistic side the Great Exhibition was a failure, and that the union of the arts and industries of Great Britain would have to be brought about in some other way. One contemporary writer[1] thus sums up his criticism of it:

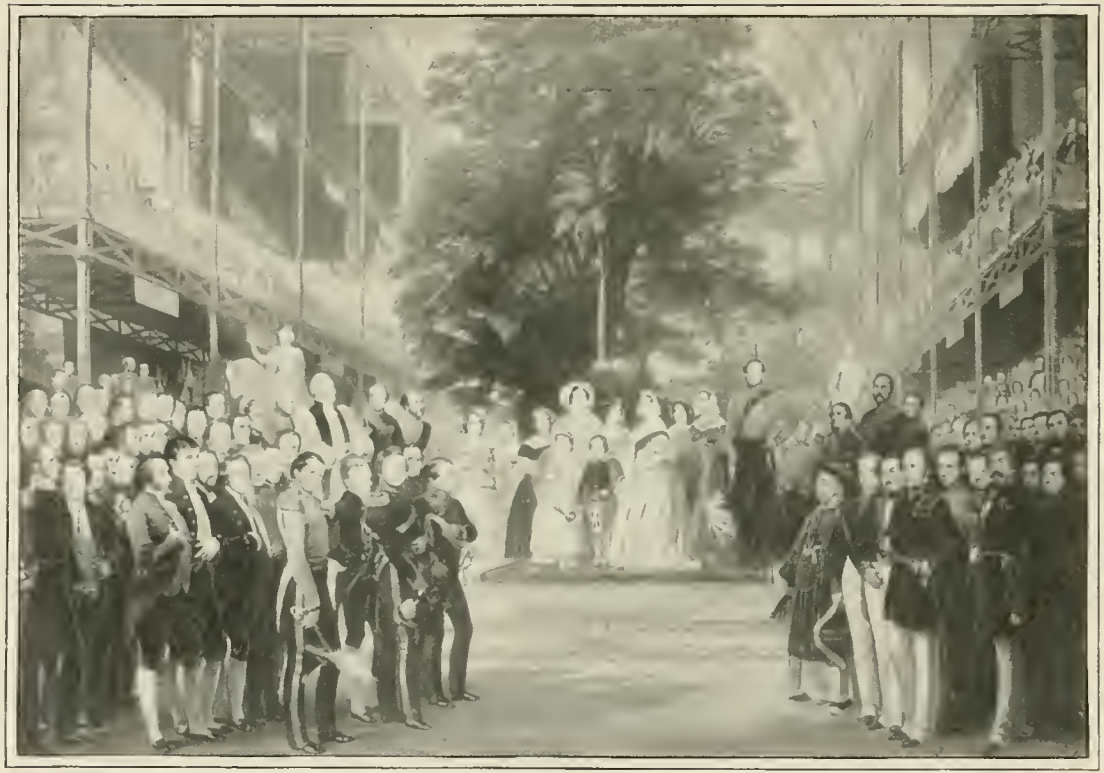
> "There is nothing new in the Exhibition in ornamental design, not a scheme, not a detail that has not been treated over and over again in ages that are gone; the taste of the producers generally is uneducated; and in nearly all cases where this is not so, the influence of France is paramount in the European productions, bearing exclusively on the two most popular traditional styles of that country—the Renaissance and the Louis Quinze."

In short, it is not too much to say that English decorative art had no distinctive style, tradition, or conviction, and in borrowing it went the easiest road by instinct, copying not the spirit of the Renaissance, but the easily caught elegance and finish in it and the ignorant vulgarity of the late French school.

Wall Papers.

Perhaps the most useful way of arriving at a true conception of the progressive condition of decorative art in England is to examine in some detail exhibits representative of those arts in the Exhibition of 1851. Of these we may begin with paper-hangings, where the process, of all mechanical processes, most shows the master-hand, and most relentlessly reveals defects and slovenliness. At best, wall-paper is but a substitute for distemper, painting or woven hanging; its surface is poor, and its colour wanting in depth; its whole success therefore depends on the delicacy and characteristic treatment of the design. The æsthetic instinct of the period expressed itself aptly on the one hand in a *chiaroscuro* frieze, copying "the best portions of the Elgin marbles," and on the other in papers with a surface cleverly imitating white silk or satin, on which natural flowers were arranged in vertical sprays or panels, remarkable neither for fidelity as studies nor for ingenuity as adaptations of natural form. The *chiaroscuro* mimicry of antique sculpture was not a new idea; a hundred years before, one Mr. Jackson of Battersea advertised his papers for a wall which represented statues—"lively portraitures of gods and goddesses in *chiaroscuro*." Such productions were a very

[1] R. N. Wornum: Essay on the Exhibition as a Lesson of Taste.



OPENING, BY QUEEN VICTORIA, OF THE EXHIBITION OF 1851, BY H. C. SELOUS.
*(Victoria and Albert Museum.)*

caricature of ornament, though they seem to have satisfied the taste of the day. One paper exhibited is spoken of as "particularly elegant and ladylike."

The carpets and woollen hangings of this date were more aggressively ugly than the paper-hangings, more commonplace

DRAWING OF THE CRYSTAL FOUNTAIN.

*(By permission of Messrs. F. & C. Osler, Birmingham.)*

in their attempt to be startling and original. One of the requirements of carpet-designing is that it should be flat and quiet, and the colours—however bright—rich and broken up, and sometimes even set, mosaic-like, in dividing outlines of a contrasting colour. But the draughtsmen of the time had no idea of following this or any other sober principle: the convention of design was meaningless to them, its laws misunderstood, the study of nature a travesty. Black was a favourite background; on

it rose-wreaths and arabesques, in crude colours and heavily shaded, started forward, striking the eye with an unpleasant feeling of unrest. The most costly shawls were all copies or "improvements in the French taste" of the Indian pine-pattern, though sometimes the less pretentious webs had rather pretty patterns—plain centres, with a narrow border of traditional Eastern design, pleasant in feeling and colour. We can hardly realise the enormity of these shawls when the design was large and striking.

CARPET SHOWING FALSE PRINCIPLES.
(*Formerly exhibited at Marlborough House.*)

The figured silks of the time had the advantage of the sheen of a beautiful material. They were usually rich and pure in quality, but their design and colour were poor, and sometimes extremely ugly, especially in those ambitious pieces where manufacturer and designer were on their mettle; the small patterns, however, were often prettily arranged. That *tour de force*, the "Coventry town ribbon," shown in the Exhibition, was probably the most disastrous piece of wasted labour ever conceived and executed. A committee of the principal manufacturers of the town were busied in its creation, 10,000 cards were used; the

Silks.

outcome of all this labour and expense was a remarkably hideous ribbon, with a black ground, on which are huddled a wreath of roses, petunias, yellow corn, and grasses.

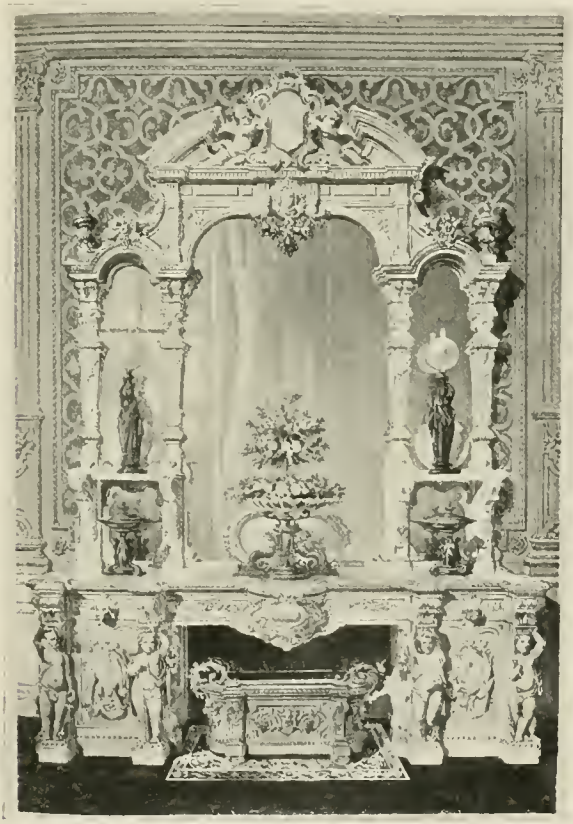
Printed Cottons.

But of patterned textiles in the mid-century it is the printed calicoes that, as a rule, alone show distinct technical skill in design. In many of these the ground is well and evenly covered, the flowers clearly and simply drawn, and, though the design is too uniform and too small in scale to be really remarkable, yet some very pretty things were produced without any straining for effect. In no other industry is this comparative excellence discoverable, though here and there, as it were by chance, a delicate form appears. For instance, one may find on a piece of pottery of this date a vine-pattern so graceful and pure in line that its union with the mechanical so-called Greek form it decorates becomes sheer incongruity and affords no pleasure. The fine porcelain of Messrs. Copeland (p. 770), flower-stands, *tazze* "peculiarly adapted for general purposes of elegant decoration," the portraits in Sèvres china of Queen Victoria and Prince Albert, Minton's majolica ware, the so-called Della-Robbia—which "connoisseurs" declared might be taken for the work of Della Robbia himself—the imitation marble-ware, in short, scarcely a thing in the whole ceramic art, calls for comment or praise from the artist's point of view.

Makeshift Art.

It is difficult to imagine the entire absence of critical feeling in all the arts: a dessert-service presented by the queen to the Emperor of Austria roused veneration for its costliness (£1,000); in an embroidered bed-hanging an admiring critic estimates the actual number of stitches and the variety of colours used. Everything that was a clever invention—this usually means the invention of some cheaper counterfeit of some other process more costly in labour and material—was considered admirable apart from the æsthetic value of the wares produced. The public eye had lost the faculty of distinguishing a good material from the imitation: "statuary porcelain" was of equal value in their eyes with marble from the Italian quarries, and hangings printed on canvas in imitation of a wrought web satisfied their desire for sumptuous Arras tapestry. These unsatisfactory results of modern invention make one consider whether the misapplications of scientific discoveries in relation to the industrial arts have not usually been as ingenious as the discoveries themselves.

In furniture, though we have since returned to the elegant but thin lines and the sparse surface-decoration of the eighteenth-century designers, inspiration was sought, during the twenty years of triumphant vulgarity between 1840 and 1860, in the never- **Furniture.**



SIDEBOARD SHOWN AT THE EXHIBITION OF 1851.
(*From "Industrial Arts of the Nineteenth Century," by Sir M. D. Wyatt.*)

forgotten late Renaissance and French decadence; while a market was found also for the "Wardour Street Gothic" of the architects of the new school. Some quite amazing drawing-room cabinets and *consoles* were evolved—decorations including star-spangled niches with statues unimpeachable in their decorous marble nakedness, patriotic groups of England's soldiers in cast

bronze, gilded griffons, trophies of arms, and cornucopias of peace and plenty. Ebony tables inlaid with silver or costly *marqueterie* were reserved for the wealthy, while paltry imitations of them satisfied the poorer classes. Beds were grandiose and superb—carved and polished, and hung with heavy curtains, with valances round, sometimes embroidered with medallions emblematic of the domestic virtues in tent-stitch.

Stained Glass.

The one obvious criticism on the stained glass of this and more recent times is that not only was there no attempt to procure a beautiful quality of colour—a matter of trouble and care, but not an impossibility—but that the fundamental mistake was made of trying to produce a *picture* on glass, with the detail painted up and highly shaded and the leading symmetrically divided, and as little of it as might be. The principal claim to admiration of several very costly windows of the time was that they were painted on one huge sheet of glass and put up, at great trouble and risk of breaking, without any lead at all. All the most beautiful glass has been treated from the earliest times as a mosaic of rich colour, only slightly painted, broad leads breaking the surface and giving extraordinary value to the colour. One window at the Exhibition exemplified this misapprehension of the capabilities of stained glass: some French thirteenth-century glass was copied, with all the characteristic scrolls and branches drawn with a good deal of skill; but the artist bethought him to shade some of the broad stems, leaving others in relief; and transformed into a genteel piece of commonplace the flat silvery effect of the old design.

Goldsmiths' Work.

A mixture of naturalism and childish symbolism was specially noticeable in gold- and silver-smiths' work. A cream-ladle must be fashioned out of a buttercup with a wriggling leaf and stalk for a handle: grape-scissors must, of course, have the rugged stem of a vine; a boudoir-clock would scarcely be complete without some banal time-emblem about it, and a silver tea-set must be engraved with scenes of the various stages of tea-cultivation. Could symbolism, the shorthand of story-telling, once fascinating us by its wayward poetry, its retelling of solemn and beautiful stories, have sunk into worse swamps of confused twaddle? It was the same with gold and silver jewellery. In the more costly ornaments the great preoccupation of the jewellers was to match their stones as perfectly as possible, and the

Jewellery.

THE INTERIOR OF THE EXHIBITION OF 1862, BY E. WALKER.

*(Victoria and Albert Museum.)*

setting of these rarely-matched stones and pearls was heavy and mechanical, little calculated to set off their splendour. Fetters and padlocks of gold, nailheads of diamond, jewelled flowers shining with the glitter of steel—the ornaments of the period are characteristic: they no longer recall the field-flowers and garlands that delight us in their frail brilliance, but suggest the chains and rivets of machinery.

The 1862 Exhibition.

The Exhibition of 1862 showed a slight improvement on the astounding absurdities of 1851, but little that calls for comment. The exhibits are at least varied. The Gobelins tapestry works send a copy of Titian's "Assumption"; an English firm send an Axminster carpet (to be used as a hanging), in which Napoleon III. is depicted, with top-boots and nicely-waxed moustache, presenting a Treaty of Commerce to the Queen, who has a surprised smile and a profile more than Grecian. The artist has exhausted his intellect in representing the shine on the Emperor's boots, which are superb. Morris and Co. (a newly-started firm) show furniture, stained glass, and embroidered hangings; William Burges, a painted cabinet, with panels by E. J. Poynter. John Thomas is grandiose with his steel and marble fireplaces, Copeland magnificent with glittering cut-glass and imitation jewelled Limoges ware. "Art-manufacture" is the trade catch-word, and there is a great deal of talk about "style," with very little knowledge or conviction. In a trade-advertisement of the day we read the following comprehensive enumeration:

"A coffee-service in the Grecian style; a wine-cooler in the Roman ditto; dinner-service in the Flemish ditto; claret-jug in the Louis Quatorze ditto."

A very masquerade procession of art!

New Architecture.

But a change was coming over the decorative movement. Pugin was dead, and Gothic architecture, with its attendant arts, was taken up by other hands. Little apparent as it may be among the fooling and trifling which have been described in the last paragraph, a certain feeling for sincerity in art, and for beauty apart from show and splendour, began to manifest itself at last. New ideas had arisen with regard to the building and decoration of houses. The red-brick domestic architecture which has long since begun to enliven many of our streets, as far as the smoke-laden air permits, had its origin in the buildings designed

by Philip Webb—buildings whose simplicity and dignity stand out alike from the stone and stucco of the earlier part of the century and the cheap villadom of later days. All credit must be given to him and to the younger men who have made an effort to bring a new life and interest into our street-architecture.

**Contrasts.**

Difficult as it is to make quite a fair estimate of any movement near the time in which we ourselves live, one may safely say that out of the experiments and the mistakes of the century some lesson has been learnt, some feeling has arisen for the decorative arts, with some perception of their importance in our daily life. Twenty or thirty years ago, if a woman with educated tastes went into one of the big London silk-mercers', it would have been impossible for her to make a satisfactory choice from among the colours and patterns shown her: she must either have been content with black or white dress-stuffs, or have turned to one of the Oriental houses where fine colours and traditional patterns were still to be found. To-day, she is no longer condemned to be isolated in a desert of ugliness; she can dress well in handsome stuffs and fine colours, and can, by paying highly, have her rooms harmoniously fitted and decorated. But only by paying highly: the "popularising of art" is at present one of those abstract phrases dear to the sentimentalist: art cannot be had cheaply, and is as much out of reach of the poor as if it were non-existent.

**The New Decoration.**

While the newspapers were exhausting their flowers of speech over the Great Exhibition of 1851, a few men here and there, writers and artists, were producing work whose influence has coloured, one way or another, the life and surroundings of the later years of the century. The first volume of Ruskin's "Modern Painters" was published in 1847, the "Seven Lamps of Architecture" (of which one critic said that "Mr. Ruskin had left one lamp out of account, and that was the Lamp of Industry") in 1849. In his writings, and notably the chapter in the "Stones of Venice" on "The Nature of Gothic"—one of the finest pieces of modern writing existing—Ruskin is the first critic of authority and note in England to draw attention to the fundamental characteristics of Gothic architecture and ornament. It is unnecessary to comment on the influence his treatises on this subject have had on modern work, no less than his pregnant

and often-repeated comments on the "Lamp of Industry" of the nineteenth century.

Rossetti and the P.-R. B.

The names of artists like Dante Gabriel Rossetti, Ford Madox-Brown, Holman Hunt, Edward Burne-Jones, Walter Crane, to mention no others, are associated not merely with picture-painting, but with a movement embracing every side of creative work in art and literature, finding its first and temporary expression in the Pre-Raphaelite Brotherhood (p. 408 *seq.*). The movement developed some ten years later into one involving all the decorative arts, bringing into modern life something of that beauty of detail in costume, in colour and form of decoration and furniture, whose absence had been so painfully, if indistinctly, felt during the century. The Pre-Raphaelite Brotherhood,[1] as such, had a short life, but the movement that inspired it and the enthusiasm of the young men who formed it gave it much more historical significance than such youthful associations among close friends usually have. The ridicule and somewhat scurrilous abuse that greeted the exhibition of their earliest work have long since given place to admiration and to the serious criticism which is due to serious art.

William Morris's Firm.

In 1860 the firm of Morris, Marshall, Faulkner and Co. began business with the intention of producing everything necessary for house-decoration: materials were to be the best procurable, the work to be done by hand where the process permitted of it, designs to be original and without reference to the prevailing public taste. Furniture, wall-papers, stained glass, painted tiles, woven hangings, tapestry, embroidery, carpets, silk brocades—everything was attempted sooner or later, and with marked success. Both Rossetti and Madox-Brown made at first cartoons for the stained glass, but even then the greater part were designed by Burne-Jones. The furniture in the hands of Philip Webb took the characteristics of his architectural work, in a certain mixture of austerity and elegance which harmonised in all details with the decorative work produced by this group of artists. William Morris's designs for applied ornament (wall-papers, carpets, hangings, etc.) were an entirely new departure. Carefully restrained within the convention prescribed by the different processes for which they were intended, they

[1] The P.-R.B. was formed in 1848 by D. G. Rossetti, Holman Hunt, and J. E. Millais, who joined the names of four other friends to their own.

manifested a keen sense of the beauty of natural forms and a remarkable power of translating that beauty into inventive and characteristic ornament. Perhaps his most remarkable undertaking has been the Arras tapestry made in the high-warp loom by the same simple process as the famous Gothic hangings of

"FLORA"—A DESIGN FOR TAPESTRY, BY SIR E. BURNE-JONES AND WILLIAM MORRIS.

*(By permission of Messrs. Morris & Co.)*

four centuries ago. Apart from the fact that this has been the only permanent production of the kind in England (the Windsor Tapestry Works are no longer in existence), it will probably be held the most notable and enduring decorative work of the century.

Japanese Influence.

The decorative movement whose history has here been slightly traced has been the principal influence of the latter part of the century, and nearly every production with any claims

to distinction shows traces of it more or less defined. The most important influence apart from them has been the introduction of Japanese art consequent upon the breaking-up of the feudal empire in 1868, and the dispersal of its treasures of art on the introduction of Western civilisation.[1] Before

TAPESTRY REPRESENTING SCENE FROM THE "MORTE D'ARTHUR," EXECUTED BY THE WINDSOR TAPESTRY WORKS, AFTER A DESIGN BY H. A. BONE.

*(By permission of the Right Hon. Lord Aldenham.)*

Japanese work was vulgarised (an outcome at once of the modern craving for novelty and of its comparative cheapness) the beautiful colour of this Oriental china, these silken stuffs and glittering embroideries, and the charm of a strange traditional art hanging about them, made such wares—in moderation—a valuable addition to English home-decoration. But their very cheapness and effectiveness became a snare to the amateur decorator.

[1] Since that date a "young" movement of decorative art has arisen, whose growth, genuine and hopeful, it would be interesting to follow, were it not excluded by the limitation of the period covered by the present volume.

The success of these decorative movements has not been universal. The praiseworthy attempts of the manufacturers to improve the decorative quality of their goods by establishing schools of art in connection with their works have been the means of stereotyping traditions out of touch with the modern movement. The tendency is towards reducing everything to a machine-finish. Thus, in china-ware, for example, the attempt to obtain purity of line and smoothness of material overwhelms the boldness of touch essential to good work; a rough piece of Breton pottery is a more pleasant object of daily use than the carefully-painted and elaborately-finished productions of our celebrated potteries. Briefly, then, at the close of our period the position of decorative art stood thus: important branches of our manufacture, such as pottery and gold and silver work, seemed to be unaffected by the modern movement. In textiles there was a marked improvement in design, and a wide range of often beautiful colour and texture had been achieved. Decorative metal-work had not yet begun to exist. In furniture the influence of the eighteenth century was perhaps paramount, though conditioned largely by the new style of architecture. As a result the representative English house of 1885 differed completely from the dreary and hopeless residence of 1850. Persian rugs, blue china, and fresh chintzes had taken the place of horsehair and mahogany and moreen curtains; some form of decoration had succeeded to a mere blind contempt of anything outside strict utility. If this attempt resulted very often in calamitous failure, that failure was due to an attempt to make out of cheap material and hurried work what can only exist as the result of wealth and leisure.

**The Position in 1885.**

As regards symphonic music, it would scarcely be too much to say that its history in England for the last seventy or eighty years has been the history of the Philharmonic Society. This body had been established seven years when, in 1820, the conductorship, previously divided, according to the fashion of the time, between the "presiding" pianist and the first violin, was entrusted to Spohr. Cherubini had previously, for the sum of £200, furnished the Society with a new symphony and other

**H. SUTHERLAND EDWARDS, Music since the Georgian Era: The Philharmonic.**

compositions: and it now became the custom to invite distinguished composers to visit London, as Cherubini and Spohr had done, and then direct the performance of some of their most celebrated works. It was in response to the invitation of the Philharmonic Society that Beethoven undertook the composition of his Ninth Symphony. The invitation was accompanied by a draft of £50. Afterwards, when the great composer was in his last illness, the Society forwarded to him, through Moscheles, £100, as a mark of sympathy and of homage.

In 1826 one of the Philharmonic Concerts had been conducted by Weber, who was in London with a view to *Oberon*, which he produced at Covent Garden. In 1829 Mendelssohn directed his C Minor symphony at the Philharmonic, and afterwards, writing about the performance, spoke of the "brilliant execution of the orchestra."

In 1842 Mendelssohn again appeared in the double capacity of conductor and pianist. Two years later he directed five of the concerts: and it was in this memorable year that Joachim made his first appearance at the Philharmonic. After the production of *Elijah* at Birmingham, in 1846—Mendelssohn's culminating triumph in England and in the world of music generally—the composer whose influence on English musicians was so remarkable conducted at the Philharmonic Society his symphony in A Minor, and played the pianoforte part in Beethoven's G Major concerto.

In 1853 Berlioz conducted at the Philharmonic his *Harold in Italy*. In 1855 Wagner directed the concerts, producing the *Tannhäuser* overture at one and a selection from *Lohengrin* at another. In the next ten years Sterndale Bennett was conductor; and it was during the first year of Bennett's conductorship that Schumann's compositions were introduced at the Philharmonic. Among subsequent conductors may be mentioned Mr. W. G. Cusins, Sir Arthur Sullivan, Mr. F. H. Cowen, and Sir Alexander Mackenzie.

"Since its institution in 1813," wrote the late J. W. Davison in the *Times*, on the occasion of the Society's jubilee, "the Philharmonic has, to use a homely phrase, seen various ups and downs. Nevertheless, even in its darkest and most threatening periods, it has never once departed from the high standard which it set itself from the

beginning, never once by lowering that standard endeavoured pusillanimously to minister to a taste less scrupulous and

SIR ARTHUR SULLIVAN, BY SIR J. E. MILLAIS, BART., P.R.A.
(*National Portrait Gallery.*)

refined than that to which it made its first appeal, and to which it is indebted for a world-wide celebrity."

About 1850 the New Philharmonic Society came into

existence, founded by the late Dr. Wylde; and, the Ancient Concerts having been brought to an end, the New Philharmonic was for some time, with the exception of the old society of the same name, the only permanent institution in England for the giving of orchestral concerts. In 1852 the New Philharmonic Concerts were conducted by Berlioz, and in 1853 by Spohr. The Crystal Palace Concerts had already been established. But it was not until Mr. (now Sir) August Manns took the direction of the orchestra, and engaged special players for its reinforcement on the Saturdays of each week during about six months of the year, that the so-called "Winter Concerts" were founded. They were the best of their kind ever given in England. The orchestra was finely composed; the conductor one of the most powerful and skilful orchestral directors that England has known; and he had under his guidance and control a practised body of players, well accustomed to follow his beat on all points, great and small. But perhaps the greatest of his merits was that he has introduced to the English public a large number of orchestral works by great masters never before heard in this country. Besides familiarising the frequenters of the concerts with Beethoven's symphonies, of which the muse-like nine have been played again and again in regular series, he produced works, previously unheard in England, by Schubert, together with the earliest and latest works of Wagner and Brahms. Extracts and arrangements from the later works of Wagner were presented at the Crystal Palace Concerts long before the *Meistersingers*, *Tristan und Isolde*, or the *Ring der Nibelungen* had been performed at any London Opera House.[1]

The Richter Concerts

For some twenty years or more the New Philharmonic Concerts were carried on; and just about the time of their discontinuance a far better series of orchestral performances was introduced under the direction of Herr Hans Richter, the famous conductor, first of Pesth and afterwards of Vienna. The Richter Concerts were of a type easy enough to describe. Consisting, as a rule, of orchestral performances exclusively, each concert was divided into two parts, the first of which was

[1 Sir A. Manns announced his retirement in 1904, after fifty years' service. The permanent Crystal Palace Orchestra was disbanded in 1900, but series of concerts of a no less high class have been given during each spring and autumn since.]

made up of excerpts, or orchestral arrangements from the operas of Wagner, while the second was filled almost invariably by one of Beethoven's symphonies. These concerts, successful from the first, and better than any that had been heard before in London (Sydenham is beyond the Metropolitan radius), presented another distinctive feature: they were wonderfully short. Schumann, in connection with Schubert's C Major symphony, speaks of "its heavenly length." The Richter Concerts never lasted, including the interval, for more than two hours.

The original type of the Richter Concert, so long maintained, was subsequently varied. Many of the Wagnerian excerpts eventually became too familiar; though it is apparently in the form of orchestral extracts that English lovers of Wagnerian music love best to hear it. This applies more particularly to the later operas of Wagner, and especially the *Ring der Nibelungen*, which in its original form proved too indigestible a mass for the artistic stomach of the English public.

A new impetus was given to the growing taste for orchestral music in England by the arrival of several famous conductors from the Continent, each with his own manner of conducting, often with his own new readings, in one case with his own orchestra: Herr Mottl, of the energetic attitudes and gestures; Herr Nikisch, so little demonstrative, or demonstrative only in the neatest and quietest manner: Herr Siegfried Wagner, who without being left-handed conducted, for the sake of originality, with his left hand: Herr Levy, who now and then laid down the *bâton* on the desk before him, as if to say, "I have directed them so well through difficult passages that they can now be trusted to go on for a time without any direction at all"; and finally M. Lamoureux, who brought over his own admirable orchestra of 100 players, and gave several interesting and finely conducted concerts of German and French, or rather of French and Wagnerian music.

Symphony Concerts were also founded by Mr. Henschel and carried on under his conductorship, and the taste for orchestral music has shown a constant increase. But while these and similar concerts, such as those at the Crystal Palace directed by Sir August Manns, were dependent for success on the continued co-operation of their respective conductors, the concerts of the Philharmonic Society have stood by them-

selves. The Philharmonic has always maintained a high standard of musical taste, and often as it has been reproached with neglecting new works, and works by new composers, it has generally kept abreast with the artistic movement in the leading musical countries of Europe. Some lesser lights may have been overlooked, but not the unmistakably great ones.

**English Composers.**

There can be little doubt but that the first works by English composers ever performed out of England (with the exception only of the nocturnes and other compositions for pianoforte by John Field, of Moscow) were the orchestral productions of Sterndale Bennett and of Macfarren, given at Leipsic when Mendelssohn was the director of the Leipsic Conservatorium. They were heard by Schumann, who made them the subject of highly appreciative articles (especially the symphonies and pianoforte concertos of Sterndale Bennett) in his famous musical journal. But they left little impression; and no other orchestral works of English origin seem to have been performed on the Continent until Mr. Cowen's Scandinavian Symphony was introduced, some dozen years ago, at Vienna, whence it made its way to various German cities, to Milan, and to St. Petersburg.

**Balfe.**

Meanwhile, apart from the Royal Academy and from academical training generally, there had appeared among us a composer of great natural talent, Michael William Balfe. He had played as violinist at the Dublin Theatre, he had sung light baritone parts with considerable success at various opera-houses in Italy, and he had even composed to Italian *libretti* several operas which were much admired, when he produced at a London theatre (in 1836) an opera called *The Siege of Rochelle*, which was received with enthusiastic applause. The work was in the ordinary operatic form of that day, which remains the only form cultivated with success by English composers and received with favour by an English public: spoken dialogue, that is to say, with solos in ballad form, duets, concerted pieces, and an occasional concerted finale. The next great success achieved by Balfe was *The Maid of Artois*, composed for Malibran, who "created" the principal part at Drury Lane under the management of Alfred Bunn.

After composing several other operas and endeavouring to found at the Lyceum Theatre an English Opera-House, Balfe

brought out in 1846, at Drury Lane, his most successful work, *The Bohemian Girl*, which has been played far oftener, both in England and abroad, than any other opera by an English composer. Known by more than one work in Italy, Balfe had also made himself a name in France by two comic operas, *Le Puits d'Amour* and *Les Quatre Fils d'Aymon*, which he brought out with success at the Théâtre de l'Opéra Comique. After being played for hundreds of nights in England, *The Bohemian Girl* made its way to Germany, where it was played at various theatres under the title of *Die Zigeunerin*, and to France, where, as performed at the Théâtre Lyrique of Paris, it was called *La Bohémienne*.

MICHAEL WILLIAM BALFE.

(*From a lithograph by C. Baugnier*, 1846.)

Under Mr. Bunn's management at Drury Lane, Balfe, Wallace, Benedict, Macfarren, and other composers produced a considerable number of original works. Of these *The Bohemian Girl* and Wallace's *Maritana* have survived even to the present day. In *The Bondman*, written throughout in music—with accompanied recitative in lieu of the ordinary spoken dialogue, with elaborate finales and plenty of solid work for the orchestra—Balfe made an attempt to secure for a grand opera the same favourable reception which had always been extended to his operas of the familiar *Bohemian Girl* type: ballad opera, that is to say, with the addition of a few concerted pieces. But *The Bondman* was coldly received; and Balfe soon reverted to the only form in which, even to this day, opera has proved acceptable in England to the general public.

English Opera.

All musico-dramatic experiments made subsequently in the form of grand opera have proved failures; though not, perhaps, by reason of the form alone. The only two composers in England who, since the time of Balfe, have written with success for the stage are the late Goring Thomas, whose

*Esmeralda* on its first production made a decided mark; and Professor (afterwards Sir Charles) Villiers Stanford, who in his Irish opera of *Shamus O'Brien*, composed in a style at once popular and artistic, has made an infinitely more favourable impression than was left by his *Savonarola* or by his far more tolerable *Canterbury Pilgrims*.

Oratorio.

The history of operatic and that of symphonic music in England do not march together on parallel lines, or with

SIR CHARLES VILLIERS STANFORD.
(*By permission, from the painting by H. von Herkomer, R.A.*)

equal step; and the frequenters of oratorio performances form a class apart from *habitués* of the Italian opera and from subscribers to the Philharmonic and other orchestral concerts. Few, however, of our genuine lovers of music can have failed to hear *Elijah*, the finest oratorio of modern times, and the most important work composed, since the time of Handel, for production in England.

The Handel Festival, which since 1857 has been given

triennially at the Crystal Palace, has familiarised thousands and tens of thousands of amateurs with the great oratorios of a composer whose name and fame are for ever associated with England, although he was not an Englishman by birth but only by naturalisation and adoption. Latterly the Crystal Palace directors showed their high appreciation of the *Elijah* by performing it on Handel Festival scale. Mendelssohn's masterpiece is the only work of the kind, apart from *The Messiah* and *Israel in Egypt*, which our musical societies know well enough to be able to do justice to its magnificent choruses.

Gilbert and Sullivan.

All things considered, the most popular English composer of the generation preceding the close of the work was beyond doubt Sir Arthur Sullivan. From song to symphony, from opera to oratorio, there was scarcely a form or a style which he had not cultivated. But his most brilliant successes were achieved in association with his unrivalled librettist, Mr. W. S. Gilbert, first at the Opera Comique and afterwards at the Savoy; and the *Mikado*, one of the happiest efforts of the two always fortunate collaborators, made Sullivan's music known in all the principal cities of the German and of the Austro-Hungarian empires. For Sir Arthur Sullivan's grand opera of *Ivanhoe* it may fairly be claimed that no more successful work in that particular form has ever been produced in English. Its success, however, was by no means equal to its merit.

J. E. SANDYS. English Scholarship, 1742-1885. Greek Scholars: Cambridge.

In the history of classical scholarship in England the foremost name in the latter part of the eighteenth century is that of Richard Porson. Born at East Ruston, near North Walsham, in Norfolk, he was sent to Eton by the liberality of the future founder of the Norrisian Professorship. Similarly a subscription started by Sir George Baker, President of the College of Physicians, enabled him to enter Trinity College, Cambridge, in 1778. He won the Craven in 1781, was elected to a Fellowship in the following year, and held it for ten years, vacating it in 1792, solely on the ground of his resolve to remain a layman. His friends once more raised a fund in his honour, and the loss of his Fellowship was thus made good by an income of

£100 per annum. In the same year he was unanimously elected Professor of Greek, the annual stipend being at that time only £40. In 1806 he was appointed librarian of the London Institution, and in 1808 he died.

Greek Scholars: Porson, 1759-1808.

Porson's literary activity was mainly limited to the twenty years between 1782 and 1803. The former is the date of his reviews of certain editions of Æschylus and Aristophanes; the latter, that of his restoration of the Greek inscription on the Rosetta Stone. In his first important work, the "Letters to Travis" (1788–9), he conclusively proved the spuriousness of the text on the three heavenly witnesses (1 John v. 7), thus upholding an opinion which had recently been expressed by Gibbon, and had also been maintained by all the best critics from Erasmus to Bentley. In 1790 appeared his preface and notes to a new edition of Toup's "Emendations on Suidas." In 1795 the Foulis Press at Glasgow produced a folio edition of Æschylus with many corrections, which were really due to Porson, though the book saw the light without his name and even without his knowledge. Twelve years had passed since the syndics of the Cambridge Press had invited Porson to edit Æschylus, and when he offered to visit Florence with a view to collating the Laurentian MS. the offer was rejected, Dr. Torkington, Master of Clare and Vice-Chancellor of the University, speaking strongly against it, and asking "why Mr. Porson could not *collect* his manuscripts at home"?[1] The syndics had also insisted on an exact reprint of Stanley's corrupt text, and Porson, not unnaturally, declined the task. In 1797 his edition of the "Hecuba" of Euripides was published, to be soon followed by the "Orestes" (1798), "Phœnissæ" (1799), and "Medea" (1801), the last alone bearing his name on the title-page. In the first edition of the "Hecuba" certain points of Greek metre were settled in a sense that was inconsistent with the opinions propounded by Hermann in a youthful work published in the previous year; Hermann retorted with a "Hecuba" of his own in 1800, and was finally answered in Porson's second edition (1802). The famous supplement to the preface is justly regarded as his finest piece of criticism: he here sets forth and elucidates certain rules of iambic and trochaic verse, and lays

[1] Kidd's "Tracts," p. xxxvi: and F. Norgate in the *Athenæum*, May 9, 1896, p. 621.

down the law determining the length of the fourth syllable from the end of the normal iambic line, tacitly correcting the errors of Hermann, but never mentioning his name, though he had named him five times over in a celebrated note on the "Medea" (l. 675). It is interesting to add that, in 1816, Hermann did honour to the memory of Porson in the most generous

RICHARD PORSON, BY J. J. KIRKBY.
(*Trinity College, Cambridge.*)

terms, describing him as *vir magnæ accuratæque doctrinæ*, a man of great and equal learning.[1] A transcript of an important MS. of the lexicographer Photius, in the library of Trinity College, which cost Porson the labour of at least ten months, was destroyed by fire in 1796; it was transcribed afresh by Porson, and published by Dobree in 1822, fourteen years after Porson's death. His transcript of the "Medea" is still to be seen in the library of his college—a work so marvellous in its

[1] "Elementa Doctrinæ Metricæ," ed. 1817, p. xiii.

caligraphy that it was made the model for the Greek type which was cut under his direction and bore his name, though it was never used during his life.[1]

Porson's services to scholarship were mainly in the department of textual criticism. He advanced the study of Attic Greek in particular, by elucidating many points of idiom and usage, by establishing the laws of tragic metre, and by the emendation of texts. His emendations were the fruit of an innate acumen exercised on an extraordinarily wide range of reading, and aided by the resources of a marvellous memory. Had it not been for the deplorable dipsomania which certainly wasted his time and probably shortened his life, he might have accomplished much more. He might have not only completed his Euripides, but also achieved that edition of Aristophanes for which a publisher vainly offered him £3,000 in 1802; he might also have left behind him a monumental work on Athenæus. The moral quality in which he was most conspicuous was his honesty —honesty in the sacrifice of his Fellowship to his conscience; honesty as a critic as well as a man. As a critic he was wont to say: "Whatever you quote or collate, do it fairly and accurately." It was said of him in his lifetime by Dr. Parr, "He is not only a matchless scholar, but an honest, a very honest man": while after his death it was confidently affirmed by Bishop Turton that "he had no superior in the most pure and inflexible love of truth." Of himself he modestly confessed, "I am quite satisfied if, three hundred years hence, it shall be said that one Porson lived towards the close of the eighteenth century, who did a good deal for the text of Euripides." Porson counted Heyne, Ruhnken, and Villoison among his correspondents; Thomas Kidd, Martin Davy, Horne Tooke, and Charles Burney among his friends. The last was one of the trustees of the fund founded in his honour, and it is to this fund that we owe the execution of his bust by Chantrey, the engraving of the portrait painted by Hoppner, and the establishment of the Porson Prize and Porson Scholarship in his own university. Nor are these his only memorials. For Cambridge and for England he became in a large measure the creator of that ideal of finished and exact verbal scholarship which prevailed for more than fifty years after his death, and is not unworthy of recognition

[1] Wordsworth's "Scholæ Academicæ," p. 392.

for its disciplinary and educational value even in the present day.[1]

Among the contemporaries of Porson we must mention Thomas Twining of Sidney, the translator of Aristotle's "Poetics" (1789), and Samuel Parr, of Emmanuel and St. John's. Parr added to the reputation which he affected as a conversationalist

Twining 1734-1804.

SAMUEL PARR, BY GEORGE ROMNEY.
*(Emmanuel College, Cambridge.)*

a certain degree of real distinction as a writer of Latin prose whether in the form of stately epitaphs (modelled mainly on Morcellus), or in the Ciceronian periods of his famous preface to Bellenden (1787). It was by a sedulous reading of this preface that facility in Latin prose was sometimes acquired at Cambridge in the age immediately succeeding the death of its author.[2] A minor light of the day was Gilbert Wakefield, the author of a hasty diatribe, prompted by the omission of Wakefield's name in Porson's "Hecuba." Porson "had forborne to mention him

Parr, 1747-1825.

Wakefield, 1756-1801.

[1] Jebb, "Porson," in "Dict. of National Biography," xlvi. 163*a*.

[2] Pryme's "Reminiscences," p. 136; quoted by Wordsworth, "Scholæ Academicæ," p. 100.

from kindness," and, on the eve of the publication of the diatribe, had good-naturedly proposed as a toast, "My friend, Gilbert Wakefield," adding the apposite quotation, "What's Hecuba to him, or he to Hecuba?' Wakefield's best work was his Lucretius (1796-7), and even this was disfigured by his rage for needless conjecture, and by his intemperate railing at the eminent French scholar, Lambinus.[1] In 1799 his treasonable expression of a hope that France would invade and conquer England compelled the Ministry to prosecute him. He was consequently imprisoned for two years (1799–1801) in Dorchester gaol; during his imprisonment he continued to correspond with Fox on points of scholarship, and shortly after his release he died. Both as a politician and as a scholar he was wanting in judgment and self-control.

Elmsley, 1773-1825.

Peter Elmsley, who was educated at Westminster and Oxford, was one of the first to recognise in the *Edinburgh Review* the great value of Porson's "Hecuba"; and he enjoyed the esteem of that great scholar until the latter "found him too ready to make use of other men's emendations without acknowledgement."[2] After staying for some years in Edinburgh, he went abroad to collate MSS. in Italy from 1816 to 1820, returning to spend the last five years of his life as Professor of Ancient History at Oxford. He edited the "Acharnians" of Aristophanes, and several plays of Sophocles and Euripides. He was the first to point out the importance of the Laurentian MS. of Sophocles; that of Æschylus was first appreciated at its proper value by a theological opponent of Porson, Thomas Burgess (1756–1837), Bishop of Salisbury.

Dobree, 1782-1825.

The year of the death of Elmsley was also that of the death of Peter Paul Dobree, Fellow of Trinity College, Cambridge, who died at the early age of 43. As a native of Guernsey, he had a perfect mastery of French, which made him most acceptable abroad. He travelled in Spain: visited France in 1814, when he was among the first to recognise the importance of the Paris MS. of Demosthenes;[3] in the following year he was a welcome guest at the Dutch University of

[1] For an estimate, *see* Munro's ed. of Lucretius, i., p. 19.

[2] Watson's "Life of Porson," p. 310.

[3] Dawes, "Misc. Crit." (ed. 2, Kidd), p. 221; quoted by Voemel, Dem *Cent.* p. 223.

Leyden.[1] He was a devoted admirer of Porson, and edited his "Aristophanica" in 1820 and his "Photius" in 1822. His own studies as a textual critic were mainly devoted to Greek prose, especially to the Attic Orators. He was Professor of Greek from 1823 to 1825. His "Adversaria" were published in 1831–3 by his successor, Scholefield.

The Porsonian tradition was no less ably maintained at Cambridge by Porson's immediate successor, James Henry Monk, Fellow of Trinity, afterwards Bishop of Gloucester, the biographer of Bentley, and editor of the "Alcestis," "Hippolytus," and both the "Iphigenias" of Euripides: and also by another Fellow of Trinity, Charles James Blomfield, who published valuable notes and glossaries to five of the plays of Æschylus, and was afterwards Bishop of London from 1828 to 1856. His able brother, Edward Valentine Blomfield (1788–1816) of Gonville and Caius, and Fellow of Emmanuel, the author of a Greek ode "In Desiderium Porsoni" (1809), showed the highest promise as a Greek scholar. He translated Matthiæ's "Greek Grammar," and was embarking on the preparation of a comprehensive Greek and English Lexicon, when his life was cut short at the early age of twenty-eight. A far longer life was allotted to another able grammarian, who was born only six years later than the birth, and died nearly seventy years after the death, of E. V. Blomfield, and proved himself a worthy countryman of Ruddiman—William Veitch, of Edinburgh, whose "Greek Verbs, Irregular and Defective," was first published in 1848, and has long been recognised as a standard authority on the subject. The task of editing Æschylus for the Cambridge Press, declined by Porson in 1782, was accepted about fifteen years later by Samuel Butler, of Rugby and St. John's, Cambridge, afterwards Bishop of Lichfield, whose edition was published in 1809–16. Verbal scholarship was not Butler's forte, but he devoted unsparing labour to the accomplishment of the work.[2] His fame, however, must rest mainly on his great services to the cause of education as Headmaster of Shrewsbury for thirty-

Monk, 1784-1856. Blomfield, 1786-1857.

Veitch, 1794-1885.

Butler, 1774-1840.

[1] Bake's "Scholica Hypomnemata," II (1839), pp. iii–v. xiv. Dobree's friend, George Burges (1786–1864), a far too eager emender of tragic texts, is briefly characterised, *ibid.*, pp. viii.–xii. For Gaisford's visit, *cf.* pp. v–viii.

[2] Mayor's "History of St. John's College," pp. 908–922; also Butler's "Life and Letters," i., pp. 23, 53; ii., p. 368.

eight years, from 1798 to 1836. The same remark may be applied to his distinguished pupil and immediate successor, Benjamin Hall Kennedy, Fellow of St. John's, a most able and vigorous teacher who was Headmaster for thirty years (1836–66), and ended his days as Professor of Greek at Cambridge. Besides several school-books, he edited the "Agamemnon" of Æschylus, the "Œdipus Tyrannus" of Sophocles, and the whole of Virgil; he also translated the "Birds" of Aristophanes and the "Theætetus" of Plato. A volume of verse entitled "Between Whiles," together with numerous contributions to the "Sabrinæ Corolla," gave evidence of his remarkable mastery of classical composition. One of his many distinguished pupils, Richard Shilleto, began at Repton and completed at Shrewsbury, under Butler and Kennedy, the training that placed him in the front rank as a classical scholar at Cambridge. He will be best remembered as the editor of the Speech of Demosthenes, "De Falsa Legatione"; of his long-promised edition of Thucydides, only the first two books saw the light. His acquaintance with the facts of the Greek language was unrivalled, and his skill as a teacher was widely appreciated at a time when private tuition in classics was more usual, and indeed more necessary, in Cambridge than it is now. Wider interests than those of pure scholarship are represented by the name of Joseph Williams Blakesley, of St. Paul's School and Trinity, Cambridge, the editor of Herodotus (1854), and the writer of a Life of Aristotle (1839). In 1872 he became Dean of Lincoln. William Hepworth Thompson, Master of Trinity from 1867, was a year or two younger than Blakesley and Shilleto, and was Kennedy's predecessor as Professor of Greek. In that position he was singularly successful as a lecturer on Euripides, Plato, and Aristotle; but he unfortunately published little besides his excellent edition of Archer Butler's "Lectures on the History of Greek Philosophy," and his admirable commentaries on the "Gorgias" and "Phædrus" of Plato. His dry humour is exemplified in many memorable sayings, but his sensitiveness and kindliness of feeling were certainly far greater than the world in general was aware; and one of his friends, the late Dean Merivale, was right in holding that too much had been made of "his pungent sayings, which acquired their fame as much from the prominence of his position as from their own

Kennedy, 1804-1889.

Shilleto, 1809 1876.

Blakesley, 1808 1885.

Thompson 1810-1886.

salieney."[1] The serene dignity of his noble presence still survives in the portrait by Herkomer in the hall of his college. When the Greek Professorship was vacated by Thompson in 1867, one of the foremost candidates for the office was Edward Meredith Cope, best known for his elaborate introduction to the "Rhetoric" of Aristotle, the precursor of a comprehensive edition of that work (1877), published posthumously together with a translation

BENJAMIN HALL KENNEDY, BY W. W. OULESS, R.A.
(*St. John's College, Cambridge.*)

of the "Phædo." One of Thompson's ablest contemporaries was John William Donaldson, author of the "New Cratylus" and "Varronianus," and editor of Pindar. His name is also associated with the "Theatre of the Greeks," and with the completion of K. O. Müller's "History of Greek Literature." Donaldson, 1811-1861.

A strikingly original and independent type of scholarship was represented by Charles Badham, in early life a pupil

[1] *Journal of Philology*, xv, 307.

Badham, 1813-1884.

of Pestalozzi, and afterwards educated at Eton, who entered Wadham College, Oxford, and, after spending seven years in Germany, France, and Italy, proved his affinity for the Cambridge school of scholarship by becoming a member of Peterhouse. He edited the "Iphigenia in Tauris," the "Helena" and the "Ion" of Euripides, and the "Philebus," the "Euthydemus" and "Laches," and the "Symposium" of Plato. In 1867, at the age of fifty-four, he became Professor of Classics and Logic at Sydney, a position which he held with distinction until his death in 1884.

Paley, 1816-1888.

A still greater variety of interests was exemplified by Frederick Apthorp Paley, of Shrewsbury and St. John's. Besides being a keen botanist, he was an enthusiastic student of ecclesiastical architecture, and an active member of the Camden Society, which flourished at Cambridge between 1838 and 1843. He joined the Church of Rome in 1846, returned to Cambridge in 1860, and finally left it in 1874. His best work was his Æschylus, begun in 1844, and published, with Latin notes, in 1847–51, and English notes in 1850 and in several later editions. He also edited Euripides (1858–60), Hesiod (1861), Theocritus (1863), and the "Iliad" (1867), besides several plays of Sophocles (1880). As he was unfamiliar with German, his scholarship owed little or nothing to foreign sources of erudition, and his learning, though not profound, was certainly wide, and distinctively his own. A certain facility of execution tempted him to undue rapidity of production, and there is little doubt that, had he written less, he would have enjoyed a more durable reputation. Some of his best work is to be found in his prefaces.

Paley, like other able scholars of his time in Cambridge, was prevented from even competing for honours in classics by his failure to obtain honours in mathematics. The same misfortune befell his accomplished schoolfellow, who was a member of the same college, Thomas Sanders Evans. His edition of the "First Epistle to the Corinthians" (1881) won him the recognition of an honorary degree at Edinburgh; and, after his death, a volume of "Latin and Greek Verse" was published "as a memorial of an original and highly gifted man, considered by many to have few rivals in his special department of scholarship."

T. S Evans, 1816-1889.

A scholar of similar but more varied gifts, and sprung from the same school, was William George Clark, Fellow of Trinity, who from 1857 to 1869 adorned the office of Public Orator at Cambridge. He visited Spain, Italy, Greece, and Poland, and, among other works of travel, published his "Peloponnesus" in 1858, the results of his Greek tour in the company of Thompson. W. G. Clark, 1821–1878.

WILLIAM HEPWORTH THOMPSON, BY H. VON HERKOMER, R.A.
(*Trinity College, Cambridge.*)

In 1860 he designed a critical edition of Shakespeare, which, with the aid of an able colleague, was happily brought to a successful conclusion in 1866. Earlier in his career he had also formed the plan of editing Aristophanes, an author for whose interpretation much had been done by T. Mitchell, Fellow of Sidney, in his translations of 1820–23, and his editions of several plays in 1836–39; while John Hookham Frere (1769–1846), Fellow of Gonville and Caius, had produced at Malta a remarkably fine rendering of five of the plays between 1830 and 1840. On the completion of the Cambridge Shakespeare, Clark spent

part of 1867 in examining the MSS. of Aristophanes at Ravenna and elsewhere, and began preparing a commentary on the "Acharnians," which he was unfortunately compelled by failing health to leave unfinished. Munro, his friend for nearly forty years, thought that "his was the most accomplished and versatile mind he had ever encountered." His work was marked by a "surprising tact and readiness," a "consummate ease and mastery." "As a charming companion and brilliant, yet gentle, talker, he had no superior": and the late Lord Clarendon, who had spent his life in the choicest social circles at home and abroad, declared that "Clark was the most agreeable man in society he had ever met."[1]

Babington, 1821-1889.

The year of Clark's birth was also that of the birth of Churchill Babington, Fellow of St. John's, and Disney Professor of Archæology from 1865 to 1880, who produced the *editio princeps* of four of the speeches of Hyperides, which had been recovered from the tombs of Egypt, beginning with the "Speech against Demosthenes" in 1851, and ending with the "Funeral Oration" in 1858.

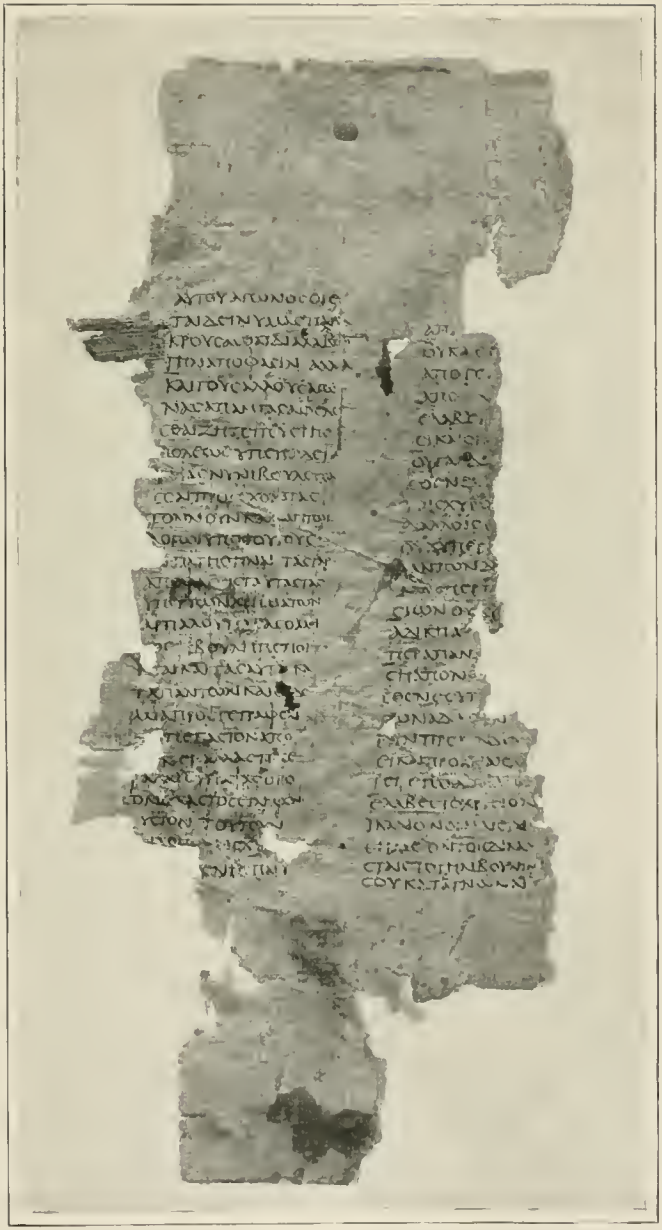
Holden, 1822-1896.

Hubert Ashton Holden, Fellow of Trinity, and Headmaster of Ipswich School from 1858 to 1883, was born a year later than Clark and Babington. He was widely known for his "Foliorum Silvula," a collection of English poetry for translation into Greek and Latin, and also for the versions of the same by various scholars published in his "Folia Silvulæ." He edited a text of Aristophanes, with an onomasticon, besides many elaborately annotated editions of classical authors, including the Seventh Book of Thucydides, the "Cyropædeia," the "Hieron," and the "Œconomicus" of Xenophon, eight of Plutarch's "Lives," and the "Pro Plancio," "Pro Sestio," and "De Officiis" of Cicero.

Oxford.

Among the representatives of scholarship at Oxford during this period, the first place in order of time belongs to Thomas Tyrwhitt, the editor of Aristotle's "Poetics" (1794: Vol. V., p. 91). The next to be named is the Nestor of his University, Martin Joseph Routh, who died in the hundredth year of his age. He edited the "Euthydemus" and "Gorgias" of Plato in 1784, published in 1832 the "Scriptorum Ecclesiasticorum Opuscula," and lived to produce the fifth volume of his "Reliquiæ Sacræ" in 1848. In the previous year, when asked, at the age of

[1] *Journal of Philology*, viii., 173-5.



FIRST FRAGMENT OF THE HYPERIDES MS.

*(Papyrus CVIII., British Museum.)*

Greek Scholars at Oxford: Tyrwhitt, 1730-1786; Routh, 1755-1854.

ninety-two, whether in the course of a long and thoughtful life he had had occasion to experience the special value of some one axiom or precept, after some reflection, he brightened up and said, "I think, sir, since you care for the advice of an old man, sir, you will find it a very good practice *always to verify your references*."[1] Though without originality of genius or power of imagination, "his marvellous memory, his quick perception, his tenacity of purpose, his indomitable industry and calm judgment—these stood to him in the place of genius."[2]

The editorial labours of Elmsley (already mentioned in connexion with Porson), and of William Linwood (1816–78), were limited to the Greek drama. A far wider field was

Gaisford, 1779-1855.

covered by Thomas Gaisford, Dean of Christ Church and Regius Professor of Greek, who, after examining a large number of classical MSS. in the libraries of Europe, edited, among many other works, the "Poetæ Græci Minores" (1814–20), Herodotus (1824), and Stobæus (1822 and 1850), as well as the great lexicons of Suidas (1834) and the "Etymologicum Magnum" (1848). As the editor of the metrical writer Hephæstion (1810), he is praised by Hermann as *dignus qui multa cum laude commemoretur*. Robert Scott, Master of Balliol, and afterwards

Scott, 1811-1887.

Dean of Rochester, has a permanent place in the history of scholarship in England as the joint editor of a monumental lexicon of the Greek language (first published in 1843). As

Jowett, 1817-1894.

Master he was succeeded in 1870 by Benjamin Jowett, who had already succeeded Gaisford as Professor of Greek in 1855. Jowett's translations of Plato (1871), Thucydides (1881), and the "Politics" of Aristotle (1885), are masterpieces of English, which have extended a knowledge of Greek literature among many who are unfamiliar with Greek. His Plato was welcomed with enthusiasm by no less a judge of good English than John

Pattison, 1813-1886;

Bright. His contemporary, Mark Pattison, rector of Lincoln, was deeply read in the history of scholarship, especially that of the late Renaissance, as is proved in part by his "Life of Casaubon" (1875), and his "Essays on Scaliger" (reprinted

Chandler, 1828-1889.

1889). Henry William Chandler, Fellow of Pembroke, produced in 1862 a standard work on Greek accents. As Professor of Moral Philosophy he gave lectures on Aristotle which were highly appreciated. He had a remarkable knowledge of bibliography,

[1] Burgon's "Twelve Good Men," i., 73. [2] *Ibid.*, p. 109.

in particular of that of the "Ethics," and his extensive collection of Aristotelian literature has happily found a permanent home in the library of his own college.

In Latin scholarship the first name in order of time is that of John Martyn, Professor of Botany at Cambridge, whose useful work on the "Bucolics" and "Georgics" of Virgil began to

**Latin Scholars: Martyn, 1699-1768.**

THOMAS GAISFORD, DEAN OF CHRIST CHURCH.

*(By permission of the Dean and Governing Body, Christ Church, Oxford.)*

appear in 1741, and passed through several editions in the next generation. The enduring influence of Bentley is apparent in the "Horatius Restitutus" of James Tate, of Richmond, in whose edition (1832, 1837) the works of the poet are printed in chronological order according to Bentley's views. The "Æneid" was the theme of the unwearied labours of James Henry, the Dublin physician who began to study Virgil seriously when over forty years of age, and published in 1853 his "Notes of a Twelve Years' Voyage of Discovery in the First Six Books of the Æneis." His larger work, the "Æneidea," founded on a personal knowledge

**Henry, 1798-1876.**

of all the best MSS. and editions of the poet, and containing many original and valuable contributions to the interpretation of the text, was printed in four volumes in 1873–89.

Munro, 1819–1885.

Hugh Andrew Johnstone Munro, educated at Shrewsbury, Fellow of Trinity, and first Professor of Latin in the University of Cambridge, produced in 1864 his masterly edition of Lucretius. His other works include an edition of the "Ætna" of an unknown poet (1867), a revised text of Horace, with illustrations from ancient gems, selected by the learned archæologist, C. W. King (1869), and, lastly, his "Criticisms and Elucidations of Catullus." He was hardly less masterly as a Greek critic; as early as 1855 he was the first to maintain the Eudemian origin of the fifth book of the "Ethics," and towards the close of his life he paid special attention to the text of Euripides. His translations into Greek and Latin verse are held in great repute; though not, like Kennedy, "an original Latin poet,"[1] he won the admiration of another master of the craft by his vigorous version of Gray's "Elegy."[2] John Conington, educated at Rugby, became, in 1854, the first Oxford Professor of Latin, edited Virgil (1863-71) and Persius (ed. Nettleship, 1872), and translated into English the whole of Horace and the "Æneid," besides completing Worsley's rendering of the "Iliad," and editing, in the early part of his career, the "Agamemnon" (1848) and "Choëphoræ" (1857) of Æschylus. William Young Sellar, Fellow of Balliol, born in the same year as Conington, was Professor of Humanity at Edinburgh from 1863 to his death. In the former year he produced his "Roman Poets of the Republic," a masterpiece of literary criticism, not unworthily followed by his valuable works on Virgil (1877) and on "Horace and the Elegiac Poets" (1892). Conington's edition of the "Æneid" was completed by his successor in the Chair of Latin, Henry Nettleship, who was mainly responsible for the second half of the work. In 1875 Nettleship embarked on the preparation of a great Latin dictionary, but was prevented from completing more than a tenth part, published in 1889 under the title of "Contributions to Latin Lexicography." Much of his time was devoted to the study of the ancient Latin grammarians, and one

Conington, 1825–1869.
Sellar, 1825–1890.
Nettleship, 1839–1893.

[1] Thompson in *Journal of Philology*, xiv., 109.

[2] *Qui stant quasi marmore versus et similes solido structis adamante columnis.* T. S. Evans, *ibid.*, v. 307-8.

of his latest tasks was the revision of the edition of Nonius, left unfinished by his friend and former pupil, J. H. Onions (1852–89). Many of Nettleship's most valuable papers have been collected in two volumes, entitled "Lectures and Essays" (1885 and 1895).

English scholars in general may be said to have paid more attention to Greek than to Latin, and to verse than to prose. Among commentaries on Latin prose authors there are few that call for mention besides the edition of Cicero's "Pro Cluentio," by William Ramsay, formerly Professor of Humanity at Glasgow, editor of the "Mostellaria" of Plautus, and author of an excellent "Manual of Roman Antiquities"; and the series of editions of Cicero's philosophical works published between 1836 and 1856 by Henry Ellis Allen ("Henricus Alanus"). The only other editions of prose authors that need here be noticed are by editors whose main reputation rests on their work as historians, Cicero's "Speeches" and Cæsar's "Gallic War" having been edited by Long, Sallust by Merivale, and the first book of Livy by Seeley.

Ramsay, 1806-1885.

In Ancient History our earliest and most notable name in this period is that of Edward Gibbon (Vol. V., p. 610). A friend of Gibbon, William Mitford, wrote a "History of Greece," in which the author allowed himself to be unduly biassed by a dislike of democracy in general. The publication of this work extended over more than thirty years (1784–1818). Though written in a spirited and lively style, it was destined to be superseded by the works of George Grote and Connop Thirlwall (p. 386). Both of these great historians of Greece were educated at the same school (Charterhouse), both attained the age of seventy-seven, and both are buried in Westminster Abbey. Thirlwall, Fellow of Trinity, and afterwards Bishop of St. David's (1840–74), produced his first volume in 1835 and his last in 1844. Grote, who had planned and begun his history as early as 1823, published his first volume in 1846, and his last ten years afterwards. His history was followed by a great work in three volumes on "Plato" (1865), and an unfinished work on "Aristotle" (1871). As a historian, Thirlwall is undoubtedly a sounder scholar and a better writer than Grote: he has also a more judicial temper and a finer sense of proportion. Grote, on the other hand, is obviously inspired with all the zeal of a partisan in his devotion not

**Historians:**
**Gibbon, 1737-1794.**
**Mitford, 1744-1827.**

**Grote, 1794-1871.**

**Thirlwall, 1797-1875.**

merely to Athenian democracy, but even to the Athenian demagogue; yet, as an intelligent and sympathetic interpreter of the ancient historians of Greece, he has great merits, while his judgment on the political and economic condition of Athens derives fresh weight from his experience as a banker and as a member of the first Reformed Parliament down to the year

WILLIAM MITFORD, AFTER H. EDRIDGE.

Mure, 1799-1860.

1841. William Mure, who, like Grote, was a Member of Parliament, and, unlike Grote, actually visited Greece, published in 1850–7 five volumes of a "Critical History of the Literature of Ancient Greece," a work which is still useful in relation to Xenophon in particular. Modern historians of Greece and Rome are deeply indebted to the chronological researches of that most methodical scholar, Henry Fynes Clinton, whose "Fasti Hellenici" were published in 1824–32, to be followed by his "Fasti Romani" in 1845–50. Thomas Arnold, Headmaster of Rugby and Professor of History at Oxford, besides producing his memorable edition of Thucy-

Clinton, 1781-1852.

dides (1830–5), left behind him a splendid fragment of a "History of Rome" (1838–43), closing with the end of the Second Punic War. In Arnold's history the influence of Niebuhr is apparent. The historical structure raised by Niebuhr's genius was attacked by an accomplished English statesman, Sir George Cornewall Lewis, who, besides translating Boeckh's "Public Economy of Athens," editing Babrius, and

**Arnold, 1795–1842.**

**G. C. Lewis, 1806–1865.**

BISHOP CONNOP THIRLWALL.
(*Westminster Abbey.*)

writing on the "Astronomy of the Ancients," produced in 1855 his "Inquiry into the Credibility of Early Roman History." George Long, of Trinity, Cambridge (who won the Craven with Macaulay and Malden, and was elected Fellow over the heads of both), after holding Professorships in Virginia and in London, and contributing to Smith's Dictionaries many articles on Ancient Geography and Roman Law, produced translations of Marcus Aurelius and Epictetus, and illustrated the Civil Wars of Rome in an annotated rendering of select "Lives from Plutarch." But his best work was undoubtedly his "History of the Decline of the Roman

**Long, 1800–1879.**

Republic" (1864–74), the value of which is enhanced by the care bestowed on setting forth the evidence of the ancient authorities. Charles Merivale, of Harrow and St. John's, Cambridge, appointed Dean of Ely in 1869, produced in the seclusion of a college living his able "History of the Romans under the Empire" (1850–62), closing at the point where the narrative of his great predecessor, Gibbon, begins. The comparative method was successfully applied to the study of early institutions by Henry James Sumner Maine, of Pembroke College, Professor of Civil Law at Cambridge (1847–54), who, after seven years of noble work as legal member of the Supreme Government of India, became Professor of Jurisprudence at Oxford (1870–78), and was Master of Trinity Hall from the end of 1877 to his death. His best known books are "Ancient Law" (1861), "Village Communities" (1871), and "Dissertations on Early Law and Custom" (1883). Other work on the constitution of primitive society will be dealt with in the section of the next chapter devoted to Philosophy.

Merivale, 1803-1894.

Maine, 1822-1883.

Classical Topography.

There are few departments of classical research in which the reputation won by Englishmen has been higher than in the field of classical topography and the archæological studies connected therewith. The foundation of the Society of Dilettantti at the close of 1733 (Vol. V., p. 360) led to the production of a splendid series of works on Greek and Roman Antiquities, including Stuart and Revett's "Antiquities of Athens" (1762–1816), Richard Chandler's "Travels" (1775–6) and "Inscriptiones Antiquæ" (1774), Sir William Gell's "Rome and its Vicinity" (1846), Penrose's "Principles of Athenian Architecture" (1851, 1889), and Cockerell's "Temples of Ægina and Bassæ" (1860). The same Society has also promoted excavations conducted by Richard Popplewell Pullan at Teos and Priene and also in the Troad (1862 70). Edmund Chishull's "Travels in Turkey" (1698–1702) were not published until 1747. Robert Wood, a member of the Dilettantti Society, travelled in Greece and Palestine in 1751 and published his works on Palmyra and Baalbec in 1753 and 1757 respectively. The ruins of Pæstum were visited and described by Major in 1768 and Swinburne in 1779. The sculptures of the Parthenon, removed to England by the Earl of Elgin in 1801–3, were purchased by the Government for £35,000 and placed in the British Museum in 1816 (p. 400).

THE ELGIN MARBLES—PORTION OF THE FRIEZE OF THE PARTHENON.
(*British Museum.*)

Dodwell, 1767-1832.

The accomplished traveller, Edward Dodwell, spent the greater part of his life in Greece and Italy; his "Tour in Greece" (with a volume of "Views") appeared in 1819, his "Cyclopean Remains" in 1834. The foremost of Greek topographers was

Leake, 1777-1860.

William Martin Leake, the author of "Researches in Greece" (1812), "The Topography of Athens" (1821), "Travels in Northern Greece" (1835), "The Morea" (1830), "Peloponnesiaca" (1846), and "Numismata Hellenica." His library and his collection of coins now belong to the University of Cambridge.

Fellows, 1799-1860.

Sir Charles Fellows became famous as the explorer of Lycia and the discoverer of the Xanthian marbles (1840), and his example was followed, with no small success, by Spratt and Forbes, who visited Lycia in 1842. The former of these published in 1865 the "Travels and Researches in Crete," which he had undertaken in 1851–3. Cyrene was successfully explored by R. Murdoch Smith and E. A. Porcher in 1860–1, and the necropolis of Cameiros in Rhodes was excavated by Salzmann and Biliotti in 1858 and 1865, to the great advantage of the collection of Greek vases in the British Museum. Among the many public services

Layard, 1817-1894. Newton. 1816-1894.

of Sir Austen Henry Layard was his exploration of Nineveh (1845). The latest name of note is that of Sir Charles Newton, the discoverer of the mausoleum of Halicarnassus (1857). During the latter part of the nineteenth century, and subsequently, Greek archæological studies have been fostered in England by the foundation of the Society for the Promotion of Hellenic Studies (1879) and by the institution of the British School of Archæology at Athens (1886).

Greek Testament.

The study of classical archæology and topography was happily united with that of the criticism of the Greek Testament in the person of Christopher Wordsworth, Bishop of Lincoln, who edited Theocritus (1844) and wrote on the *graffiti* (or wall-scribblings) of Pompeii, and also on Athens and Attica and the "Topography of Greece," divining in the course of this last work the long-lost site of the oracle of Dodona. In 1856 he published a commentary on the Greek Testament, rich in citations from patristic literature. Fuller reference is made to the German commentators in the edition of Henry Alford, Dean of Canterbury. Several of the Pauline Epistles in particular were admirably edited by Joseph Barber Lightfoot, Bishop of Durham (p. 595), who was also the editor of Clement

of Rome, and Ignatius and Polycarp. In connection with textual criticism must be mentioned, besides the names of

WINGED AND MAN-HEADED LION FROM THE PALACE OF ASSUR-NASIR-PAL, KING OF ASSYRIA; EXCAVATED BY SIR A. H. LAYARD.

(*British Museum.*)

Tregelles (d. 1870), Scrivener, and Hort (d. 1892), the Revision by the joint labours of English and American scholars of the Authorised Version of the New Testament, a work which occupied ten and a half years, from June, 1870, to November, 1880.

Hebrew.

In the study of Hebrew almost the only notable names of Cambridge scholars in the present century have been those of Samuel Lee (1783–1852), Professor of Hebrew and Arabic at Cambridge; W. H. Mill, his successor in the Chair of Hebrew, who died in 1853, and was better known as a learned theologian and scholar; and Frederic Field (1801–85), honorary Fellow of Trinity, whose edition of Origen's "Hexapla" placed him in the first rank of Hebrew and Syriac scholars. Meanwhile, at Oxford the chair of Hebrew was filled for fifty-four years by Edward Bouverie Pusey (1800–82), who published a "Commentary on the Minor Prophets" and "Lectures on the Prophet Daniel" (1862–4). The Revision of the Authorised Version of the Old Testament, the joint work of many competent Hebraists, begun in 1870, was not completed until 1884. The Revised Version of the Old Testament has met with a more favourable reception than that of the New, partly because it did not disturb the text of the original, partly because it was confined to the correction of errors without attempting a rigid uniformity of rendering.

Syriac.

The study of Syriac was successfully pursued by William Cureton (1808–64), of Christ Church, Oxford, Canon of Westminster, who published a Syriac MS. of the "Epistles of St. Ignatius" in 1845 and 1849, the text of the Syriac version of the "Festal Letters of St. Athanasius," and the remains of an ancient recension of the Syriac Gospels from a MS. of the fifth century (1858); by Robert Payne Smith (1818–95), Dean of Canterbury, who, besides many other labours in the field of Oriental learning, began, in 1868, the publication of an important Syriac Lexicon; and by Robert Lubbock Bensly (1831–93), Fellow of Gonville and Caius College, who was the first to publish, in 1875, from an Amiens MS. of the ninth century, the missing fragment of the Latin translation of the Fourth Book of Ezra, discovered by him in the previous year, and who spent part of the last year of his life in deciphering an important Syriac MS. of the Gospels, discovered in 1892 in the Convent of St. Catharine, on Mount Sinai.

Arabic.

Bensly's discovery of the missing fragment of the Fourth Book of Ezra was anticipated by John Palmer (1787–1840), Fellow of St. John's, Professor of Arabic from 1804 to 1840, a master of many languages, who was so singularly reticent that

it was said of him that he could be silent in more languages than any man in Europe. During his travels in Spain in 1826 he discovered the missing fragment in a Complutensian MS. of the eighth century, but he buried all knowledge of this fact in his papers, and his discovery was not published until thirty-seven years after his death.[1] The most eminent representatives of Arabic during the present century have been Edward William Lane (1801–76), the author of the great Arabic Lexicon, and translator of the "Arabian Nights": William Wright (1830–89), Fellow of Queens', Professor of Arabic in Cambridge from 1870 to 1889, the author of the best Arabic grammar now in existence, and distinguished as a Syriac scholar; and Edward Henry Palmer (1840–82), Lord Almoner's Reader in Cambridge, a man of singular versatility, who showed the highest genius for the acquisition of Oriental languages, travelled in the "Desert of the Exodus" in 1868–9, produced, among many other works, an excellent Arabic grammar (1874), and died in Arabia in the service of his country during the rebellion of Arabi in 1882. His successor in the readership, William Robertson Smith[2] (1846–94), after studying physics with distinction, devoted himself to Oriental languages, and became famous for his encyclopædic learning. He was librarian of the University of Cambridge, and afterwards Professor of Arabic. Thomas Chenery[3] (1826–84), of Gonville and Caius College, Lord Almoner's Reader at Oxford, was mainly an Arabic scholar, but he was also a good Hebraist, and wrote Hebrew with elegance.

**Turkish**

In Turkish one of the leading authorities in England was Sir James William Redhouse, the author of a grammar and dictionary of the Ottoman language, and other works, and the translator of a mystical Persian poet. It was Redhouse's pocket manual of Turkish conversation that was used by our officers during the Crimean War. To the distinguished diplomatist, Sir John Malcolm (1769–1833), we owe the "History of Persia," which is still the standard work on the subject. The Persian

[1] J. S. Wood, *Journal of Philology*, vii. (1877), 64.

[2] Eventually one of the Editors of the *Encyclopædia Britannica*, and the occasion, by his advanced views on Old Testament criticism, of a prolonged controversy in the Free Church of Scotland, 1875–1881.]

[3] Editor of the *Times* after the famous Delane.]

Persian. language was successfully studied by Sir William Ouseley and his younger brother, Sir Gore Ouseley (1770–1844). The former was the greater scholar, though less conspicuous in public life: the latter, apart from his public distinctions, was author of "Lives of the Persian Poets." The cuneiform inscriptions of Persia, Assyria, and Babylonia were deciphered by Sir Henry Creswicke Rawlinson (1810–95), and by Edward Hincks (1792–1888), Fellow of Trinity College, Dublin.[1] Lastly, the Chair of Chinese was founded at Oxford in 1875; while, at Cambridge, an honorary professorship of that language was held by the eminent diplomatist, Sir Thomas Francis Wade (1820–95), who presented to the University his valuable library of Chinese literature.

Cuneiform Inscriptions.

Chinese.

Sanskrit. The first Englishman who obtained any mastery of Sanskrit was Charles Wilkins (1749–1836). Beginning his study of that language in India in 1778, under the encouragement of Warren Hastings, he translated the "Bhagavadgītā" (1785) and the "Hitopadeça" (1787); he also produced a Sanskrit grammar (1808), and a work on "Sanskrit Radicals" (1815). Sir William Jones (1746–94), of University College, Oxford, the translator of the legal speeches of the Attic orator, Isæus, was first attracted to Sanskrit (in 1784) by its bearing on Indian law; he soon detected its philological importance, pointing out in 1786 its affinity with Greek, Latin, Gothic, and Celtic, and in 1789 its connection with Zend. He translated Kālidāsa's drama, "Sakuntalā," and also the "Institutes" of Manu; his commentaries on Eastern poetry, and his history of Nadir Shah are still classical works. Burnouf and F. Schlegel both learnt their Sanskrit from an Indian civilian, Alexander Hamilton, who was captured by Napoleon in 1802 and detained until 1807, and was thereby enabled to excite the first interest in the language in France and Germany. William Carey (1761–1834), the Baptist Missionary, published a Sanskrit grammar (1806), and edited and translated the "Rāmāyana" (1806–10); he also translated the Bible into Sanskrit, as well as into Bengali and Mahrathi. But the greatest of English Sanskritists was Henry Thomas Colebrooke (1765–1837), whose "Essays on Sanskrit Literature," published in a collected form in the year of his death, are recognised

[1] "Royal Irish Academy," vol. xxi; W. G. Vaux in "Annual Report of Royal Society of Literature," 1867.

as masterpieces of insight and research. He had previously produced elaborate translations of the two standard Sanskrit treatises on the law of inheritance (1810), and also of certain mathematical and philosophical works (1817). Even more was done for the actual spread of the study by a man of less genius,

SIR WILLIAM JONES, BY SIR JOSHUA REYNOLDS, P.R.A.
*(By permission of the Right Hon. Earl Spencer.)*

Horace Hayman Wilson (1786–1860), the first Professor of Sanskrit at Oxford (1833), whose dictionary (1819, 1832) made the further study of the language possible in Europe. B. H. Hodgson discovered the remains of Northern Buddhist literature in Nepal; and J. Muir, the founder of the Sanskrit Chair in Edinburgh, was to the close of his life an enthusiastic student of the Veda; while R. C. Childers was the first to publish, in 1875, a dictionary of Pāli, the sacred language of the Buddhists. The discovery of the affinity of Sanskrit with other languages led to

the foundation of the Comparative Philology of the Indo-European languages, which has become a recognised branch of study in the universities of England.

Anglo-Saxon and English.

The study of Anglo-Saxon received a new impulse in 1772 by the publication of Lye and Manning's dictionary: 1823 is the date of Sharon Turner's "History of the Anglo-Saxons," described by Kemble as a "learned and laborious work, yet, in all that relates to the language and poetry of our forefathers, often deficient, often mistaken." Thorpe produced an edition of Cædmon in 1832, the "Analecta Anglo-Saxonica" in 1834, and "Ancient Law" in 1840; while John Mitchell Kemble (1807–57), of Trinity, Cambridge, a friend and pupil of Jacob Grimm, edited Beowulf in 1833–7, and the "Codex Diplomaticus Ævi Saxonici" in six volumes in 1839–48, founding on this great collection of charters his important "History of the Saxons in England" (1849). Edwin Guest, Master of Gonville and Caius from 1852 to 1880, was the author of a "History of English Rhythms" (ed. Skeat, 1882) and of "Origines Celticæ" (ed. Stubbs, 1883), containing important papers on the Anglo-Saxon conquest. Among those who did excellent work for the Philological Society, and the Early English Text Society (started in 1864), was Richard Morris, who, in his "Specimens of Early English" (1867) clearly made out the chief characteristics of the three main dialects of Middle English, the Northern, Midland, and Southern. Some of the most successful researches into pronunciation of English in bygone times were those of Alexander John Ellis (1814–90), of Trinity, Cambridge, whose "Early English Pronunciation, with special reference to

J. M. KEMBLE, BY T. WOOLNER, R.A.
(*Trinity College, Cambridge.*)

Chaucer and Shakespeare," was published in several parts between 1869 and 1875. Our list of Anglo-Saxon scholars may here close with the honoured name of Joseph Bosworth (1790–1876), a member of the same college, whose elementary grammar appeared in 1823, and his larger dictionary in 1838. He filled the Chair of Anglo-Saxon at Oxford from 1858 to 1876, and, by a gift dating from 1867, led to the foundation of the Elrington and Bosworth Professorship at Cambridge eleven years later.[1]

T. WHITTAKER. Philosophy and Anthropology.

THE English philosophical tradition is continued in our present period first of all by Alexander Bain (1818–1904). Professor Bain's two greatest works, which form together a complete treatise on psychology, with philosophical applications, belong chronologically to the preceding period. The first, "The Senses and the Intellect," appeared in 1855; the second, "The Emotions and the Will," in 1859. In his statement of Associationism, Professor Bain modified the position of Hartley and James Mill; recognising "association by similarity" as equally fundamental with "association by contiguity." One of his most conspicuous merits was that he had taken up and developed the doctrine of the "muscular sense." His theory of the growth of volition was an original achievement in psychology. Assuming the infant to start with a tendency to spontaneous activity, in addition to the passive susceptibilities constituting special sense, he traced developed will to association of other psychical states, by links of feeling, with spontaneous movement as its germ. "Mental and Moral Science" (1868) is a compendium of psychology together with a short treatise on ethics and a historical account of systems. Professor Bain's "Logic" followed the lines of Mill; but a sharper demarcation was made between the provinces of formal and material logic, and in the latter more

Bain.

[1] The above outline of the history of English scholarship for the century and a half which closes with 1885 does not pretend to be anything more than a brief retrospect of the careers of its leading representatives in the past. We can hardly presume on the present occasion either to estimate the eminence or to forecast the fame of scholars who are, happily, still living. *Olim nominabuntur, nunc intelleguntur.* (They will be named hereafter: they are appreciated now.)

account is taken of contemporary physical ideas. "Mind and Body" (1873) gave a concise statement of the doctrine that mental and physiological processes (more particularly those in the nervous system) are uniformly concomitant, but are not to be regarded as causes of one another.

PROFESSOR ALEXANDER BAIN, BY SIR GEORGE REID, P.R.S.A.
(*By permission of the Principal and University Court of Aberdeen.*)

Spencer.

Herbert Spencer (1820–1904), whose influence begins to become marked early in this period, was both a great psychologist and a great systematic philosopher. His first published book was "Social Statics" (1851). Here he laid down positions which led to the minimising of State action, a political doctrine which he held to the last, though on somewhat different grounds. This first work comes nearer to the assertion of "abstract rights" known prior to experience than was really consistent with the principles of Spencer's philosophy; for he was, like the greatest among his English predecessors, an experientialist.

Where Spencer made a new departure in modern thought was in introducing the doctrine of evolution into psychology and philosophy. This step had already been taken in the "Principles of Psychology" (1855), four years before the appearance of the "Origin of Species." Here biological

**Evolution in Mental Science.**

*Photo: Elliott & Fry, Baker Street, W.*
HERBERT SPENCER.

evolution is expressly accepted as an incomparably more scientific doctrine than special creation, though the imperfection of the evidence for it is fully recognised. In the "Principles of Biology" (1864–7) the Darwinian doctrine of natural selection is incorporated; but for Spencer this is only one of the factors of organic evolution, the others being direct action of the environment on the organism, and inherited effects of the use and disuse of organs. "First Principles" (1862) set forth Spencer's general philosophy. It contains in its first part a metaphysical doctrine, and in its second a scheme of cosmical evolution embracing both the

physical phenomena of the universe and the phenomena of life, mind, and society. Spencer put forward his metaphysical doctrine as a consistent development of Hamilton's and Mansel's philosophy of the Conditioned. The Unconditioned, or Absolute, is positively known to exist, but is in itself for ever unknowable. Mental and material phenomena are its manifestations. These are knowable, and are the objects of science. The Unknowable is the object of the religious sentiment. Remaining always a mystery, insoluble by human thought, it is yet ever presenting itself anew at the bounds of science. Science and religion are reconciled by acquiescence in the mystery, without any attempt to evade it by assertions which are necessarily groundless or meaningless.

The formula of evolution, stated and illustrated in the second part of "First Principles," is applied in the succeeding volumes of Spencer's "System of Synthetic Philosophy" to Biology, Psychology, Sociology, and Ethics: the detailed application to inorganic nature being omitted. The "Biology" and "Psychology" (second edition, 1870–2) have already been referred to. The "Sociology" was not finished till 1896, and the completion of the "Ethics" also lies beyond our period. The very important first volume of the "Principles of Sociology," however, appeared in 1876, and the "Data of Ethics" in 1879; so that a word may be said of them here.

In the "Psychology" the doctrine of evolution is applied to explain those cognitions that seem intuitive, in a manner consistent with the philosophy that derives all knowledge from experience. The results of experience, Spencer holds, are passed on from one individual to another by heredity; hence in explaining knowledge we are not confined to the experience of each individual. There is an inherited experience of the race, on which that of the individual is superimposed. This same conception can be applied to ethical theory. By inherited experience, along with other factors, we get what are practically moral intuitions. Also, in the attempt to arrive at moral rules for new cases, the doctrine of evolution gives us an immense advantage over the older utilitarianism. We are able to take for our basis certain biological and sociological laws in order to arrive at rational precepts such as could never be arrived at by mere empirical

summation of pleasures and pains. We have thus for our morality a rational instead of an empirical utilitarianism.

Spencer's "Sociology."

The first volume of the "Sociology" contains what is known as Spencer's "ghost-theory" of religion. Generalising from accumulated facts about savage tribes, and then reconstructing subjectively the mental processes of primitive man, Spencer traces the idea of invisible personal agents with powers over man's destiny to the idea of a second and invisible self accompanying the body. This idea is suggested naturally by various normal and abnormal phenomena, such as shadows, reflexions, sleep, dreams, trances, etc. In its application to explain some of these phenomena, the second self, or soul, has to be supposed capable of an existence separate from the body. Pursuing the same train of thought, the savage thinks of his invisible self as still existing after death, with powers intermittently active in the visible world. A world of ghosts is imagined, having more or less fitful or constant relations with the world of living men. The ghosts of ancestors are propitiated by offering to them—in some way that to the savage mind seems efficacious—such things as they were pleased with during life. The most potent of the imagined ghosts—the ghosts, for example, of kings—are from the first objects of a special worship, and this may come to predominate more and more. Here we have the beginnings of a pantheon, and of the whole subsequent evolution of religion.

This is only one of the topics dealt with in the "Sociology." Other topics are marriage customs, modes of ceremonial observance, political and ecclesiastical institutions. It is noteworthy that in their actual treatment of the science they both call "Sociology," Comte and Spencer lay stress on different parts of the subject. Comte deals mainly with the historical evolution of Europe: Spencer dwells especially upon the prehistoric and archaic preparation for all historical evolution. Both alike treat their subject as philosophers; that is, in subordination to a scheme meant to include the whole of scientific knowledge in a synthetic or unified form. Simultaneously with this philosophic development, a number of investigators have arisen who aim at dealing with the origins of society in the spirit of purely special and positive science.

Treated in this way, the science has come to be called Anthropology. Chief among its cultivators are John Ferguson McLennan (1827–81) and Dr. E. B. Tylor. McLennan's "Primitive Marriage," which in England marks the beginning of one class of anthropological inquiries, appeared in 1865. In the same year appeared Dr. Tylor's "Researches into the Early History of Mankind." Since about that time there has been practically continuous work on the subject (*cf.* p. 666).

Anthropology: McLennan and Tylor.

From various symbolical forms which remain in the marriages of peoples that have attained the highest monogamic stage, taken along with what can be learnt of savage and archaic customs, McLennan reconstructed the history of the marriage relation. The system of tracing kinship through males, he found, is preceded by a stage in which it is traced exclusively through females. This was the kind of blood-relationship that first became obvious when men emerged from a stage of promiscuity within the tribe. The "patriarchal" family, instead of coming at the beginning of social development, comes at the end. McLennan himself carried the subject further in essays on "Kinship in Ancient Greece" (finding there traces of "female kinship"), "Totemism," *i.e.* the relation between certain tribes and animals or plants held sacred by them, etc. Many of his particular conclusions are still matter of dispute, but he must always be regarded as a pioneer in the subject. Dr. Tylor also has worked at this branch of inquiry. His name, however, is more particularly associated with investigations into the history of religion. In his theory of a primitive "Animism" he attacks the problem which Spencer tries to solve by the "ghost-theory." Ideas of the soul, according to Dr. Tylor's view, arise as a kind of primitive philosophy to explain the connexion between mind and body. The notion of the soul or invisible self is naturally suggested by the phenomena of reflexions, shadows, etc., as in Spencer's view. When definitely formed, it is used as a perfectly general means of explanation; souls of all objects being assumed, as well as of men, animals, and plants. This primitive Animism contains the germ of religion. The most important difference between Dr. Tylor's theory and Spencer's seems to be that while Spencer traces all gods to ancestral ghosts, Dr. Tylor leaves

open the possibility of explaining some deities as direct impersonations of natural phenomena, after the idea that all things have souls has once been formed.

Of those who have dealt with Anthropology as a special science, Dr. Tylor has done most to define its exact scope and to develop its method. He places it, as the "science of culture," between the inquiries of prehistoric archæology, on the one side, and of history proper on the other. Geological conclusions with regard to the antiquity of man give scientific ground for assuming a long interval between the earliest beginnings of arts, of religions, of political institutions, and so forth, and their developed state in civilisations such as those of Asia and Europe. It is this interval that the special inquiries of anthropologists aim at filling up. As confirmatory evidence of the reconstructed process of development, they point especially to the phenomena known as "survivals in culture"; that is, traces in the most highly civilised societies of what are held to be primitive institutions. These correspond exactly to functionless "rudiments" of organs in biology. We readily see that an evolution such as the anthropologists suppose is in perfect harmony with the doctrine of biological evolution, being both confirmatory of it and confirmed by it.

*Photo: Gillman & Co., Ltd., Oxford.*

DR. E. B. TYLOR.

The influence of Comte on English thought was especially promoted by the writings of George Henry Lewes (1817–78), whose exposition of "Comte's Philosophy of the Sciences" appeared in the same year (1853) as Miss Martineau's abridged

**Lewes and Comte.**

translation of the "Philosophie Positive." In Lewes's "Problems of Life and Mind" (1874–9) a profound idea of Comte that was not taken up by Mill, and for which Spencer has no precise equivalent, was introduced into English psychology. Comte, indeed, repudiates the notion of psychology as a subjective science with introspection for its method; nevertheless, he brought out more effectively than anyone before him the dependence of the individual for his mental life as a personality on the existence of the "social medium." This idea Lewes worked out so as to give psychologists the benefit of Comte's insight.

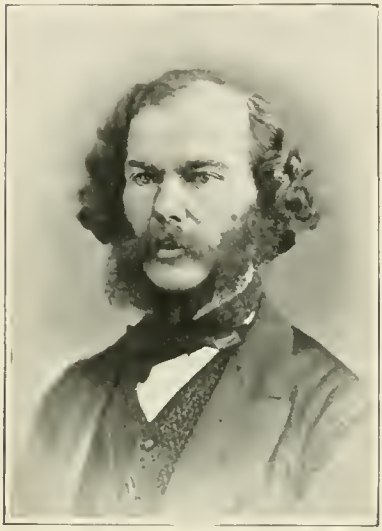


*Photo: Elliott & Fry, Baker Street, W.*
GEORGE HENRY LEWES.

Lewes, though distinctively a psychologist and philosopher, occupied himself also with physiological research, and, in his "Problems," sought to define the relations between physiology and psychology. Others who are more distinctively cultivators of special science worked in the same direction. Drs. Maudsley and Hughlings Jackson brought the study of mind into relation with pathology as well as with physiology. Dr. D. Ferrier, in "The Functions of the Brain" (1876), tried to found on experiment a theory of the localisation of particular sensory impressions and motor powers in defined cerebral areas. Among men of special science Professor Huxley perhaps did most service to general philosophy. Mr. (afterwards Sir) Francis Galton, besides his important biological work, contributed to the theory of psychological heredity, and, in papers on "mental imagery," threw new light on what takes place in the mind when we form conceptions. The suggestive metaphysical speculations of W. K. Clifford may also be referred to.

**Physiological Psychology.**

Psychology itself began in this period to be treated more

as a special science. The work of Professor Sully, for example, was mainly positive psychology, to the exclusion of the metaphysical inquiries mixed with it in older English treatises on the mind. The necessity for this clear demarcation was urged by George Croom Robertson (1842–92), who also best represents the English tradition face to face with the reaction of what is known as the Hegelian school.

**The Hegelian Reaction**

The leader of this reaction was Thomas Hill Green (1836–82), whose celebrated Introductions to a new edition of Hume in 1874 were meant to overthrow English Experientialism as represented especially by J. S. Mill. The later English thinkers, Green insisted, were wrong in trying to retain the principles which Hume had shown to result in scepticism. Hume's scepticism was the starting-point for the genuine reconstruction begun by Kant on different lines, and carried higher by Hegel; but to maintain anything like Hume's or Locke's own positions is no longer possible. With the purpose of proving this in detail, Green undertook a close examination of Locke, Berkeley, and Hume. The self-contradictory character of their positions being shown, nothing really remained, in his opinion, for the assailant of Experientialism to dispose of; all its later representatives being less thorough-going than Hume, and having avoided scepticism only by not pushing their arguments, as Hume did, to the end. Green's more original works, in which he states his doctrine on its positive side, have appeared posthumously, beginning with the "Prolegomena to Ethics" (1883).

*Photo: Walker & Cockerell.*

PROF. W. K. CLIFFORD.

*(By permission, from the Portrait by the Hon. John Collier, in the National Portrait Gallery.)*

In other contemporary philosophic writers as well as in

Green the German influence goes deeper than in those who, like Whewell and Hamilton, came at an earlier period more or less under the influence of Kant. To the intervening period belongs Dr. Hutchison Stirling's "Secret of Hegel" (1865), in which Hegel was definitely put forward as the author of a true philosophy for this and succeeding ages. Mr. Shadworth Hodgson's works, the most important of which is "The Philosophy of Reflection" (1878), have been deeply influenced by the thought both of Kant and Hegel, though Mr. Hodgson attaches himself not to the German but to the English tradition. Within the Hegelian school an independent position is taken by Mr. F. H. Bradley, from whom has proceeded important logical work. Professor W. Wallace, of Oxford (1844–1897), translated Hegel's "Logic," and furnished it with valuable prolegomena.

Croom Robertson.

On the lines of Mill, the logical works of Dr. Venn take a chief place. Others, in general philosophy, have continued to follow the experiential tradition without directly considering the objections of its new opponents. The most direct attempt to meet the Hegelian school on general philosophic ground was made by Croom Robertson (1842–1892), who, while recognising the force in Green's criticisms, questioned his assumption that later English thinkers have made no advance on Hume. Even as against Hume and Berkeley, if we make explicit that distinction between psychological questions about the origin of knowledge and philosophical questions about its validity which they did not themselves formulate, many of Green's arguments lose their point. It is true, Robertson allowed, that English experientialists of the present century would have done better to meet Kant in detail; but their failure to do this has had its compensation, since, by working on their own lines, they have arrived at principles that furnish a real reply to the new objections against their traditional mode of philosophising. What is essential in the English tradition from Locke onwards is simply this, that philosophical questions, though not identical with psychological questions, are to be approached through psychology. Robertson himself sought to make good a defect in Mill's "Logic" by his theory of mathematical axioms (1875), which may be regarded either as a translation of Kant into psychological terms or as a solution of Kant's problem from the experiential point of view.

1885]

To our present period belong several important ethical treatises. Dr. Martineau's "Types of Ethical Theory," coming at the end of the period, was a classical expression of the doctrine known as Intuitionalism. Professor Sidgwick's "Methods of Ethics" was on utilitarian lines, but seeks to arrive at principles common to Utilitarians and Intuitionalists. Leslie Stephen's Ethics.

DR. JAMES MARTINEAU, BY A. E. EMSLIE, A.R.W.S.
*(By permission of the Artist.)*

"Science of Ethics," written from the evolutionary point of view, makes great use of the revived conception that man is fundamentally a social being. This conception, which belongs both to Hegel and Comte, is implied all through Green's "Prolegomena to Ethics." Green's lectures on political philosophy, published in the collected edition of his works, depended on the same conception; which may, perhaps, be regarded as the one incontestable acquisition of English thought during the latter part of the nineteenth century without respect to the distinction between rival schools.

AGNES CLERKE. Astronomy, 1846-1885.

On September 19th, 1848, an eighth member of Saturn's family of moons was discovered simultaneously by Lassell at Starfield, and by Bond at Cambridge, U.S.A. It received the name of Hyperion. The recognition of Saturn's dusky ring was likewise a duplicate event, although Dawes, the English observer, on November 25th, 1850, had been slightly anticipated by Bond. The meteoric constitution of the entire ring-system was theoretically proved by Clerk Maxwell (1831–79) in 1857, and, after the lapse of thirty-seven years, was experimentally verified with the spectroscope by J. E. Keeler, at Allegheny, in Pennsylvania.

Cosmogony.

An important contribution to lunar theory was made by Adams's demonstration, in 1853, that the cause assigned by Laplace for the secular acceleration of our satellite was insufficient, although, in its measure, true. This raised the question of a possible lengthening of the day by tidal friction, and brought into view the part played by that agency in modifying the relations of mutually revolving bodies. Professor G. H. Darwin showed, in 1879, that it had been exceptionally effective in the earth-moon system: and his researches pointed to the origin of the secondary body by "fission" from a fluid, or plastic primary. He extended them, in 1881, to the whole solar system, but obtained no such definite results. This effort to apply rigorous methods to cosmogony has been imitated for binary stars by Dr. See, of Chicago. Of far wider import was the introduction of the great principle of the Conservation of Energy, due, in large measure, to Joule's determinations, in 1843 and 1849, of the mechanical equivalent of heat (p. 258). One of its effects was to set a limit to the age of the sun. Since its heat-emissions involve contraction in bulk, it must—according to Lord Kelvin's calculations—have been, some twelve million years ago, eight times less dense than now—in other words, its specific gravity was about one-sixth that of water: while, after the lapse of five to ten million future years, it will be as heavy as lead. We cannot, indeed, say for certain that a body six times more tenuous than water might not have been brilliantly luminous, but there can be no doubt that extinction will long anticipate condensation even to the average massiveness of the earth. Estimates of this kind, however, should be accepted with due allowance for complications of which we are ignorant.

Solar Physics.

The announcement made by Sir Edward Sabine, May 6th, 1852, of a strict coincidence between the terrestrial-magnetic and sun-spot periods, drew increased attention to solar physics; and the observations of spots made by Richard Christopher Carrington (1826–75) during the years 1853–61, led him to the significant conclusions that the rate of the sun's rotation slackens

THE MOON, PHOTOGRAPHED BY WARREN DE LA RUE.
(*By permission of the Royal Astronomical Society*)

progressively from the equator towards the poles, and that the spot-zones close downwards in latitude with the exhaustion of each cycle of disturbance.

Photography in Astronomy.

Warren de la Rue (1815–89) was a pioneer in celestial photography. He obtained pictures of the moon by the collodion process in 1853; and the systematic self-registration of sun-spots was begun at Kew, in 1858, with his "photo-heliograph." His photographs of the eclipsed sun, July 18th, 1860, taken with the same instrument at Rivabellosa, in Spain, proved decisively the

solar status of the "red prominences" by exhibiting their independence of the moon's motion. The high value of the camera for the delineation of the solar corona was accentuated by the fine photographs taken by Brothers during the Mediterranean eclipse of December 22nd, 1870, and by artists attached to Lord Lindsay's party at Baikul, and to General Tennant's party at Dodabetta, during the totality visible in Southern India, December 12th, 1871. Their discussion by A. Cowper Ranyard in 1879

THE RIVABELLOSA EXPEDITION, 1860.

*(From an old photograph in the possession of the Royal Astronomical Society.)*

brought out the "synclinal" arrangement of coronal streamers; while their comparison with photographs of the American eclipse of July 29th, 1878, suggested to him a variation of coronal type in correlation with the variation of spotted surface, since amply verified. Plates exposed by Dr. Schuster to the eclipsed sun, May 17th, 1882, at Sohag, in Egypt, disclosed a beautiful comet hurrying past perihelion while half enmeshed in coronal rays; and the brilliant radiated solar halo, characteristic of spot-maxima, was imprinted upon them, as well as in photographs taken by Messrs. Lawrance and Woods, May 6th, 1883, on Caroline Island, in the Southern Pacific.

During the period now under consideration, a far-reaching change has taken place in the methods and aims of astronomy. The telescope has found auxiliaries in the spectroscope and the camera, and auxiliaries of such versatile powers that their performance continually outstrips their promise. The new science

DR. SCHUSTER'S PHOTO. OF THE ECLIPSED SUN, 1882.
(*By permission, from the Philosophical Transactions of the Royal Society*, 1883.)

of astrophysics deals with the nature of the heavenly bodies, while the elder gravitational astronomy is concerned with their movements; but a meeting-place has been provided by spectroscopic determinations of motion in the line of sight; and signs are not wanting that celestial mechanicians will fully respond to the novel demands upon their resources.

The principle that the qualities of prismatic light emitted or

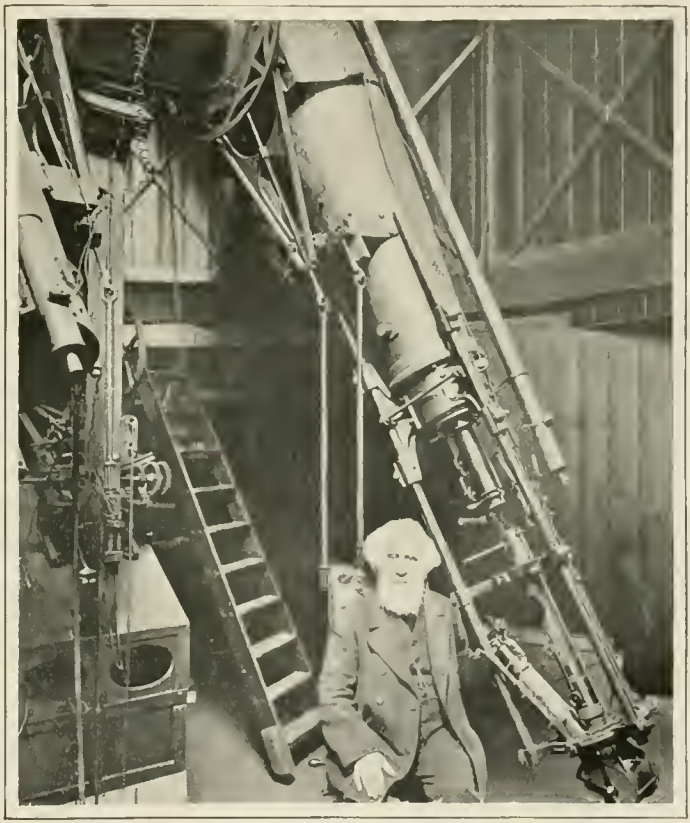
Spectroscopy.

absorbed by glowing vapours are unfailingly distinctive, was, by Kirchhoff, in 1859–60, made the basis of solar chemistry. In England the subject was energetically prosecuted by Mr. (now Sir) Norman Lockyer, who devised the "analysing spectroscope," and, on March 4th, 1866, applied it to the examination of a sun-spot. The spectroscopic method of viewing prominences in full sunshine was also arrived at by him, independently of Janssen, in October, 1868, after their light had been proved, by observations during the Indian eclipse of August 19th, 1868, to be of gaseous origin. Bright lines due to hydrogen were conspicuous in it; and with them appeared a yellow ray emitted, as Lockyer and Frankland quickly perceived, by a then unknown substance to which they gave the name of "helium." Lockyer's and Respighi's examination with the "slitless spectroscope" of the corona seen, by favour of the interposing moon, at Baikul in 1871, had an experimental value; but the first definite and complete record of the nature of the coronal spectrum inscribed itself on Dr. Schuster's negatives in 1882. Their study inspired Dr. (now Sir William) Huggins with the idea of photographing the corona itself without the aid of an eclipse, by means of its strong ultra-violet emanations, and he obtained some apparently genuine pictures; but their promise has remained unfulfilled.

*Photo: Elliott & Fry, Baker Street, W.*
SIR NORMAN LOCKYER.

In conjunction with William Allen Miller (1817–70), he entered, in 1862, upon an investigation of stellar spectra; and communicated to the Royal Society, May 26th, 1864, the earliest definite particulars regarding the chemistry of stars. In the spectrum of Aldebaran, lines characteristic of hydrogen, iron, sodium, calcium, magnesium, and other substances were identified; and the composition of Betelgeux was shown to be similar, though not identical. The outburst of "T Coronæ," detected May 12th, 1866, by John Birmingham, of Tuam in Ireland, afforded the first opportunity of analysing the light of a temporary star. It was proved at Tulse Hill to be enveloped

in a blaze of hydrogen and other gases. Nova Cygni, which leaped into visibility November 24th, 1876, showed itself to be similarly circumstanced; but a strange development of light at



OBSERVATORY OF SIR WILLIAM HUGGINS, K.C.B., TULSE HILL

the core of the great Andromeda nebula in August, 1885, was of a different and dubious nature.

On August 29th, 1864, Dr. Huggins made the capital discovery of gaseous nebulæ. The subject of his initial experiment was a "planetary" in Draco. He found nearly the whole of its light concentrated in a single green line, as yet unidentified with any terrestrial substance. And the case was typical. In all gaseous nebulæ (with perhaps one exception), comprising,

besides planetaries, the irregular kind exemplified by the vast structure in Orion, the same ray predominates, although associated, as Dr. Huggins at once perceived, with hydrogen-emissions. He stated at the same time that the majority of undistinguished nebulæ, besides all star-clusters, give an unbroken spectrum, indicating notable progress in condensation.

The first photograph of a star-spectrum was taken by Dr. Huggins in 1863; but it was his adoption, in 1876, of the "dry-plate" method, permitting long exposures, that determined his success in this branch. On December 18th, 1879, he exhibited to the Royal Society seven very perfect "spectrograms," six of which were derived from "white stars" like Vega. And in all of these a rhythmical series of dark lines was strongly impressed, evidently representing the ultra-violet continuation of the hydrogen-spectrum, the essential character of which was thus brought to view through the analysis of rays emitted many years previously in the depths of space. The spectrum of the Orion nebula was photographed with the same apparatus March 7th, 1882. At Tulse Hill, also, the momentous step was taken in 1868 of introducing into astronomical researches the spectroscopic method of determining motion in the line of sight. Its importance can scarcely be exaggerated. It is true that stellar radial velocities, thus visually estimated, are subject to large uncertainties; from which, however, measures on photographic plates are for the most part exempt. On this principle, a couple of years later, the tremendous agitations of the solar chromosphere were studied by Lockyer, with the result of showing the prevalence there of tornadoes whirling at rates up to 120 miles a second.

**Variable Stars.**

John Russell Hind (1823–95) was the first English discoverer of asteroids. As an observer at Mr. Bishop's establishment in the Regent's Park, he captured Iris and Flora, August 13th and October 13th, 1847, and added later six more members to the same family. On April 28th, 1848, a "new star" was detected by him in the constellation Ophiuchus. It rose in four days from the seventh to the fifth magnitude, then rapidly faded into obscurity. But his most remarkable discovery, made October 11th, 1852, was that of a small nebula in Taurus, which has since frequently disappeared and re-appeared. Confirmatory instances are not wanting. The phenomenon of variability in

these objects adds vastly to the importance of their photographic portrayal, the complete success of which was assured by Dr. Common's exquisite picture of the Orion nebula, taken with his three-foot silver-on-glass reflector January 30th, 1883.

From an examination of the spectrum of Winnecke's comet in 1868, Dr. Huggins concluded its chief material to be a hydrocarbon gas: and the inference has proved true of most, if not all, comets. The two bright apparitions of May and September, 1882, blazed, however, with sodium as they closely approached **Comets and the Spectroscope.**

SPECTRUM OF THE SUN AND GREAT NEBULA IN ORION.

*(By permission, from Sir William and Lady Huggins' "Atlas of Stellar Spectra," 1899.)*

the sun, and the latter with iron besides. Both were observed by Dr. Copeland at Dunecht. The transit of the September comet across the sun, watched by Mr. Finlay and Dr. Elkin at the Cape, was an unique event. Photographs of this fine object, taken under the supervision of Dr. (afterwards Sir David) Gill showed the unexpected advantages of common portrait-lenses for getting impressions of nebulous masses; and the multitude of stars on the plates not only suggested to Dr. Gill the plan of his photographic "Durchmusterung" (review), giving the places of 350,000 southern stars, but started the grand international star-charting enterprise, still (1904) in course of execution.

English astronomers have led the attack upon the arduous problem of the sun's distance. The necessity for a large reduction in the accepted value of ninety-five million miles was recognised by the Royal Astronomical Society in 1864, and the transits **The Sun's Distance.**

of Venus in 1874 and 1882 were anticipated as opportunities for settling the matter definitively. Expeditions, admirably organised by Sir George Airy and Mr. Stone, the late Radcliffe Observer at Oxford, were despatched, on both occasions, to

THE ORION NEBULA, PHOTOGRAPHED BY DR. COMMON, JANUARY 30TH, 1883.
*(By permission of T. A. Common, Esq.)*

various parts of the globe: yet with little effect in diminishing the uncertainty. More confidence was inspired by Dr. Gill's single-handed operations upon Mars at Ascension in 1877, giving ninety-three million miles as the value of the great unit.

**Stellar Distance.**

The parallaxes of several stars were reliably measured by Dr. Brünnow (1821–91), astronomer royal for Ireland, and by his successor, Sir Robert Ball, between 1867 and 1881. The

determinations of nine southern stars by Gill and Elkin, in 1882–3, showed the heliometer to be the instrument best adapted for this class of work. They fixed the distance of *a* Centauri—still our nearest known sidereal neighbour—at twenty-five billions of miles; showed Sirius to be about twice as remote; and the brilliant Canopus to lie altogether beyond the reach of their soundings. Dr. Gill succeeded Mr. Stone as

PHOTOGRAPH OF COMET OF SEPTEMBER, 1882, SHOWING NUMEROUS STARS.

*(By permission of Sir David Gill, K.C.B.)*

H.M. Astronomer at the Cape in 1879, Mr. Stone having occupied the post from the retirement of Sir Thomas Maclear in 1870. At Greenwich the administration was transferred, in 1881, from Sir George Airy to Mr. W. H. M. Christie.

**The Nebular Problem.**

A profound alteration has, since 1846, affected ideas regarding the structure of the universe. Sir John Herschel's description of the Magellanic Clouds as aggregations of sidereal matter in all stages of condensation proved, as Whewell insisted in 1853, and Herbert Spencer in 1858, that star-clusters and nebulæ differ generically: and the fact was rendered patent by Huggins's application to them of the spectroscope. The distribution of nebulæ, too, in obvious correspondence with the

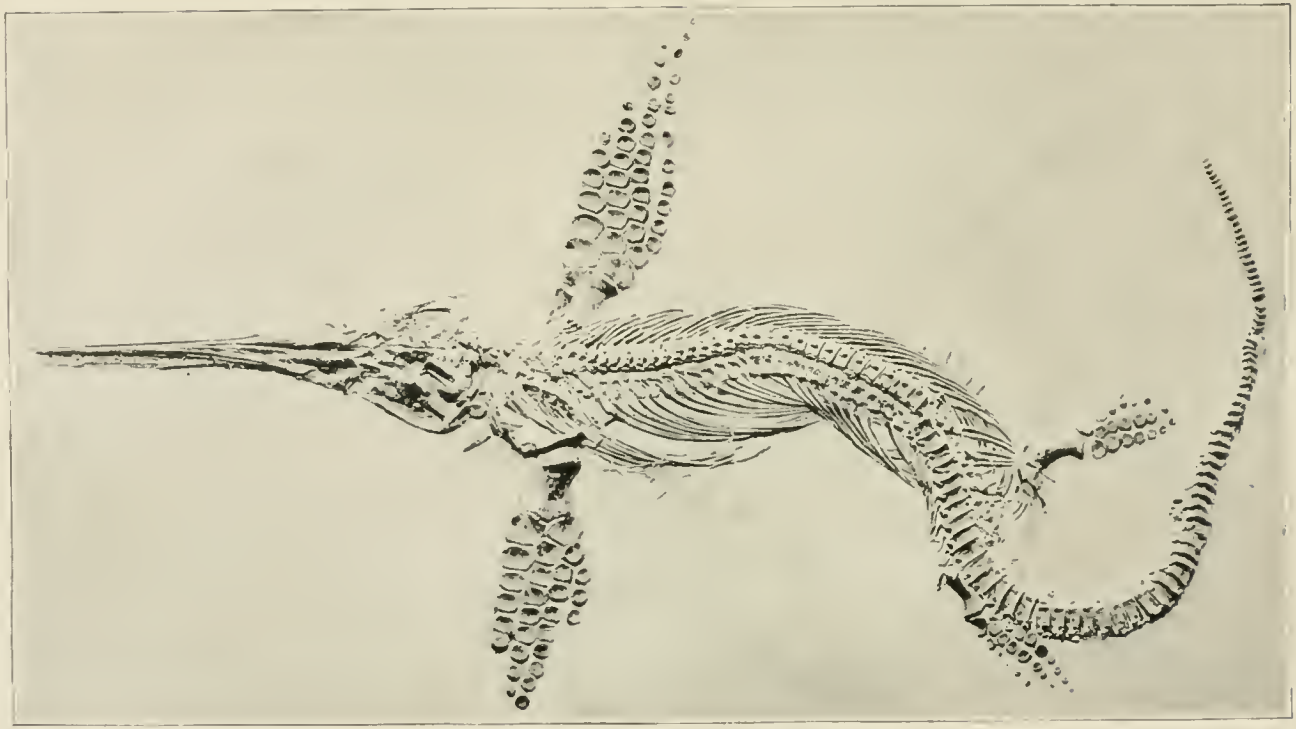
lines of the Milky Way (shown in Mr. Sidney Waters's chart of 1869), effectually reduces them from the status of independent starry realms to the less pretentious rank of members of the galactic system. This truth was enforced in many of R. H. Proctor's writings. Thus, the investigation of the nature, distance, and architecture of the Milky Way has come to be the prime object of cosmical inquirers.

T. G. BONNEY. Geology and Palæontology, 1846 1895.

Using 1833, the year when the publication of Lyell's "Principles" was completed, as a new point of departure, we may trace the progress of the science down to the present day. Soon after this date a separation into subordinate branches becomes more easily recognised. The palæontologist found an ample field in studying fossils, not only as the stratigraphist had already done, for chronological purposes, but also for the significance of their zoological (or botanical) affinities and diversities. In this matter, during the earlier part of the century, Brongniart, Deshayes, and Lamarck, in France, were ahead of any English workers in their knowledge of fossil conchology, and Cuvier may justly claim to be the father of vertebrate palæontology. But soon after his death (in 1832) Richard Owen began to rise into repute as a British successor to the distinguished Frenchman, and a little later—early in the fourth decade—Edward Forbes became distinguished for work among the invertebrates, which was ended by his death, while still in his prime, in 1854.

Palæontology

In 1847 the Palæontographical Society was established, with the avowed intention of figuring all the British fossils. Among the contributors to the splendid volumes which are annually issued will be found most of the palæontologists who have attained eminence in Britain. It must suffice to name only a few memoirs from those members whose work is done, such as that of T. Davidson, on the Brachiopods; J. W. Salter, on the Trilobites; Milne Edwards, Haime, and P. M. Duncan, on the Corals; T. Wright, on the Sea-urchins and Starfish; Searles Wood (aided by his son), on the Crag Mollusca; and R. Owen, on extinct Reptiles and Turtles. The work also of W. B. Carpenter, on the Foraminifers; of his son, P. H. Carpenter, on the Crinoids; of Hugh Falconer and T. H. Huxley, the one in certain, the other in many departments of vertebrate palæonto-



ICHTHYOSAURUS TENUIROSTRIS (CONYBEARE).

*(From the Lower Lias of Street, Somerset. Natural History Museum.)*

*Reproduced by permission from the "Geological Magazine," Vol. VIII., 1891.*

logy, and that of W. C. Williamson, in fossil botany, though published elsewhere, must not be forgotten. Many still living have followed in their steps, but an enumeration of these, in the limits to which this notice must be restricted, would be a mere catalogue of names; a selection would be an invidious task.

Natural Selection and the Geological Record.

In 1859 Charles Darwin published his famous book "On the Origin of Species by Means of Natural Selection" (p. 434). This idea, which had occurred independently to A. R. Wallace while he was at work in the Malayan Archipelago, though mainly an induction from the study of living animals and plants, obviously depended also on the evidence of fossil forms. At first sight this seemed, on the whole, unfavourable, and the independence of species was maintained by not a few eminent palæontologists, although Darwin in his famous chapter on "the imperfection of the geological record" had indicated the need of caution in dealing with negative evidence. But evolution, as the new doctrine was called, found from the first an advocate in T. H. Huxley; and more recent discoveries in palæontology have not only removed many difficulties, but also supplied much additional evidence, so that the old idea of separate centres of creation now finds but few supporters among philosophic naturalists.

The Glacial Theory.

One immediate result of the publication of the "Principles" was to give greater prominence to the study of physical geology, a subject hardly separable from physical geography. The older geologists had seen in mountain-peaks and valleys the records of mighty movements of the earth's crust, and W. Hopkins, of Cambridge, had attempted to explain the valleys of the Weald as a result of strains in the upheaval of the region; but as "convulsionist" views lost ground, a more and more confident appeal was made to the forces still at work. The credit of indicating clearly that the rivers make the valleys, rather than the valleys the rivers, is due, more than to any other man, to J. B. Jukes, Director of the Geological Survey in Ireland. His views were published about the year 1862, and are now generally accepted among geologists.

But before this another great forward step was made. In many parts not only of Britain but also of Northern Europe superficial deposits of gravel, often coarse as well as fine, of sand and of clay, commonly full of stones, occur at various elevations,

lying like a mantle over the ordinary Tertiary and older rocks. Some of these stones attain a large size, and isolated boulders are scattered here and there over the country. These were formerly claimed as proofs of the tumultuous action of an universal deluge, but careful study began to show the difficulties in this hypothesis, and appeal before long was made to another means of transport. About 1835 De Charpentier, a Swiss geologist, maintained that the erratics and boulder clays of his country had been deposited by glaciers at a time when they had extended far beyond their present limits in the Alps; and in 1840 Agassiz, of Neuchâtel, devoted himself to a careful study of the Alpine glaciers. He was visited, while thus occupied, by J. D. Forbes, noted for his researches into the physics of glacier ice, and by W. Buckland, with whom he afterwards investigated the north of Britain. Here they found signs of ice action similar to those in Switzerland: the discovery, announced by Buckland, though too startling to be at once accepted, gradually obtained credit, and further examination showed that all the mountainous districts of Britain had been similarly occupied by glaciers. But as to the extent of the ice considerable difference of opinion still prevails. By one school a very large part of the English lowlands, the bed of the Irish Sea and most of Ireland as well as Northern Europe to the south of Berlin, are asserted to have been enveloped in a great ice sheet, which is even believed by some to have invaded the country from Polar regions. Another school restricts the ice within narrower limits, and attributes most of the lowland deposits, with certain shell-bearing gravels found even in the hill regions, to the action of shore-ice and floating ice while the land was submerged.

ERRATIC BLOCK AT SEAMER STATION, YORKSHIRE.

But in 1862 A. Ramsay, who had already done excellent work on the track of ice in Britain, aroused a controversy by claiming a new effect for glaciers. In a paper read to the London Geological Society he attributed the basins of the greater Alpine lakes to the erosive action of ice, and *a fortiori* the lakes of the various mountainous regions of Britain. This produced a controversy. His opponents maintained the effect of ice to be abrasive rather than erosive, and thus to be incompetent, under the most favourable circumstances, to produce more than a shallow tarn, and they attributed the larger lakes to unequal movements in the beds of valleys at a very late period in their history. The controversy is not ended, but it is perhaps not unfair to say that Ramsay's views have not found their most ardent supporters among those geologists who are most familiar with mountains and glaciers.

Slaty Cleavage.

No unimportant step was made in physical geology when the structure called slaty cleavage was understood. The phenomena were observed and correlated by Sedgwick in a masterly communication to the Geological Society in 1835. The true explanation, that this structure was a consequence of pressure, was gradually established by Sharpe and others.

The Ocean Depths.

The knowledge of the form, deposits, and fauna of the deeper parts of the ocean has been enormously augmented since the middle of the present century, especially by the voyage of the *Challenger*, which, after three or four tentative expeditions, was sent out by the Government from 1873 to 1876. The results of this extended investigation of the great ocean basin have been embodied in a long series of memoirs, the publication of which is only just completed (1896; p. 927).

The Antiquity of Man.

Closely connected with the last epoch in the earth's history is the question of the Antiquity of Man. Buckland so early as 1822 had described the contents of Kirkdale Cave in Yorkshire, in which bones of hyænas and other animals foreign to this country had been found, but had appealed to them in his "Reliquiæ Diluvianæ" as proofs of an universal deluge. Lyell in 1833 had examined a collection made by Dr. Schmerling from caves in the Meuse valley, where the bones of man were associated with those of extinct mammals, and had formed his own conclusions. In 1847 Boucher de Perthes had announced the discovery of flint implements of human workmanship in

gravel on the flanks of the Somme valley, but this announcement did not obtain general credence among English geologists till about twelve years later, when it was confirmed by John Evans, Falconer, and Prestwich. The river gravels in southern and eastern England were then examined, as well as the caves

WILLIAM PENGELLY, F.R.S., BY A. S. COPE, A.R.A.

*(By permission of the Torquay Natural History Society.)*

in various hill districts, notably that called Kent's Hole, near Torquay, which was systematically searched by W. Pengelly, with the aid of the British Association. The result was to demonstrate, by overwhelming evidence, that England, not to mention other parts of Europe, had been occupied by men of a very low civilisation at an age when many animals now extinct were abundant—an age sufficiently remote to allow time enough for the occurrence of important physical changes. These con-

clusions, like others previously arrived at by geologists, came in for much censure on the part of would-be champions of Christianity; but they have now passed into the category of questions merely scientific, and it is generally admitted that the human race must have appeared in this part of Europe immediately after, if not before, the Glacial Epoch.

Petrology.

One branch of geology still remains to be noticed, that whereby the science is connected with mineralogy—namely, the department called petrology or the study of rocks, especially of those which have either solidified from a state of fusion (igneous), or subsequently undergone marked changes (metamorphic). Many of the geologists at work during the earlier years of the century had studied mineralogy, and thus were as good petrologists as was possible with the instruments at their disposal. But with the increasing interest in palæontology and stratigraphy, petrology became temporarily neglected; neither Murchison, who succeeded De la Beche at Jermyn Street in 1855, nor Ramsay seemed to apprehend that it was a subject which demanded careful study. Thus the maps of the Geological Survey often embodied very grave mistakes, and hypotheses which time has proved to be misleading were supported by its authority. Among the latter, one which proved a most serious impediment to progress was mainly due to Murchison himself. In 1858 he recognised, as the result of a personal examination, that the coarse gneissose rocks underlying the Torridon Sandstone of the North-West Highlands were more ancient than any system which had as yet been identified in Britain, but at the same time he claimed the schists and flaggy gneisses south of the area just named (including the Central Highlands) as metamorphosed Silurian rocks. These, however, were maintained by James Nicol, of Aberdeen, to be also parts of a very ancient series; but this view was scouted by Murchison and the Survey, and for nearly twenty years Nicol seemed to be the sole champion of a lost cause. Doubts then began to be raised; the district was again examined; and in 1884 the Director-General of the Survey announced that his predecessor had been wrong, and Nicol right in his main contention. The apparent sequence of the rocks and the modifications which gave a more modern aspect to the seemingly upper mass were due

to a remarkable displacement and its mechanical effects. The credit of this discovery is largely due to Professor Lapworth.

Petrology once more came to the front, after H. C. Sorby, in 1856, had applied the microscope to the examination of thin sections of rocks. Though there is yet much to learn, great progress has been made towards a rational classification of the igneous rocks and a proper understanding of the processes by which the rocks called metamorphic have been produced. Since then rapid progress has been made, and important results had been obtained even prior to 1884.

Mineralogy.

The science of mineralogy—the parent, as some consider it, of geology—has also made not a little progress in the epoch under consideration, but mostly in directions which cannot be easily described without the use of technical language. Here also, as might be expected, Sorby's method of investigation has proved of great value, especially in tracing the history of mineral changes; while the use of the spectroscope and other appliances of modern chemistry has led to important results, including the discovery of new but rare elements. Great progress also has been made with crystallography, not only by the employment of more perfect instruments, such as the goniometer, but also by the use of a system of crystallography, beautifully adapted for mathematical treatment, which was developed by William Hallowes Miller from the cruder methods of his predecessors. It was published about the year 1838, in a decade which, as we have seen, was remarkably characterised by important advances in science.

The year 1815 found geology in a most rudimentary condition: 1885 left it fully developed. Though as yet an illusion which has always hampered its real progress has not been wholly dispelled—viz. that it is a science in which anyone, however ignorant, may speculate, and on which he may write—there is perhaps at present a little danger from the opposite extreme. It is that of over-estimating the importance of minute details, of missing real resemblances in the study of superficial differences, of dwelling too much on questions of nomenclature and matters which pertain to literature rather than to science; and, above all, of forgetting that hypotheses conceived in the laboratory or the museum are of little value

till they have been tested in the open air and compared with the evidence which Nature herself supplies.

W. G. RHODES. Physics, 1846–1885.

Whilst Joule's work (p. 258) was as yet scarcely appreciated in England, Helmholtz in 1847 published an essay, entitled "Ueber die Erhaltung der Kraft," in which, as its title indicates, the principle of conservation of energy was developed. Helmholtz was at the time a military surgeon, and knew but little of Joule's work. The essay was a very powerful one, and, taken together with Joule's experimental evidence, placed the principle on a firm basis. Although for a long time doubted, this law came to be received on the same footing as Newton's laws of motion; and some of the greatest discoveries in thermodynamics, and other branches of physical science, have been deduced from it. To reduce any result now to a contradiction of this principle is to reduce it to an absurdity. Quoting Clerk Maxwell, the principle in its most general form is that "the total energy of any body, or system of bodies, is a quantity which can neither be increased nor diminished by any mutual action of these bodies, though it may be transformed into any of the forms of which energy is susceptible."

Helmholtz, in 1871, gave up his medical work, and was appointed Professor of Physics in the University of Berlin, where he spent the remainder of his life. In his treatises on "Physiological Optics" and "Sensations of Tone," he presented to the scientific world works of rare value. No one was better fitted than he to undertake works like these, for he combined with his extensive knowledge of physics a paramount acquaintance with physiology and psychology. There is scarcely any branch of physics which does not testify to his profound thought and striking originality. Problems which had puzzled the greatest mathematicians were successfully attacked by him, and those students who were so fortunate as to be under his guidance testify by their own works to the greatness of him whose intellect they in part reflect.

Tyndall.

The man who did the most to popularise natural science in England was John Tyndall. From his earliest childhood he had been taught the art of expressing his ideas in a clear and simple manner. He left school in 1839, and joined a division

INTERIOR OF THE GEOLOGICAL MUSEUM, JERMYN STREET.

of the Ordnance Survey. In 1847 he accepted a teaching appointment at Queenwood College, Hampshire. Here he stayed till the following year, and applied himself chiefly to the study of chemistry, along with Dr. Frankland, one of his colleagues. In 1848, Tyndall and Frankland went together to Marburg, in Hesse-Cassel. In those days Germany was ahead of England in the teaching of science, so the two determined to add a German training to their English education. Tyndall's attention was called to the new property of magnetism, which Faraday had lately announced, and it was suggested to him by Dr. Knoblauch that the two should repeat Faraday's experiments, and inquire more closely into the true nature of diamagnetism. Professor Plücker, of Bonn, found that some crystals, made of diamagnetic substances, did not exhibit diamagnetic properties. To account for this he attributed to crystals an optical axis, which he supposed to be influenced in a peculiar manner when placed in a magnetic field.

After long and careful investigation Tyndall and Knoblauch came to the conclusion that the action of magnetism on bodies depended upon their molecular structure, or as Tyndall expressed it, upon their peculiarities of material aggregation. In 1851 Tyndall announced that the same laws govern both magnetic and diamagnetic phenomena. In 1853 he was appointed to the chair of Natural Philosophy at the Royal Institution.

The subject which owes most to Tyndall is that of radiant heat. Before he commenced his investigations but little was known about it. The quantities to be measured were so small, and existing apparatus so crude, that physicists had never attempted any accurate measurements of radiant heat. Tyndall, however, overcame the experimental difficulties, and, in 1864, published a paper "On the radiation and absorption of heat by gases and liquid matter," in which he showed that the absorption of non-luminous heat by vapours is the same as that of the liquids from which they are produced.

On January 21st, 1870, Tyndall delivered a lecture, at the Royal Institution, on "Dust and Disease," and gave the results of some investigations of his own on floating organic matter in the air. Examination of air before and after being subjected to a very high temperature showed that a large proportion of the dust it contained was organic matter, since it disappeared on

being burnt. In the course of the lecture Tyndall propounded a germ theory of diseases, saying that as surely as a pig comes from a pig, or a grape from a grape, so surely does the typhoid virus, or seed, when scattered about among people, give rise to typhoid fever, scarlatina virus to scarlatina, and small-pox virus to small-pox: and that the virus was carried about by the

*Photo: Bassano, 0A Bond Street, W.*

PROFESSOR JOHN TYNDALL.

floating organic matter in the air. Many eminent men were present at the lecture, and those of the medical profession received his views with disfavour, going so far as to ridicule the germ theory. The accuracy of that theory has since, however, been proved over and over again, and the discovery of the way in which diseases are spread has been of incalculable benefit to mankind.

It was as a popular lecturer that Tyndall excelled. The reason of his success in lecturing to the "unscientific" may

be found in his aptitude for imparting his knowledge in the simplest language, and in exciting the interest of an audience by homely illustrations. He probably did more than any other man of science to raise the standard of education amongst the uneducated classes.

Faraday's "Tubes of Force."

When Faraday propounded his theory of electromagnetism, in which he explained the various phenomena by means of hypothetical "tubes of force" in a hypothetical medium, his views met with distrust on all sides. His methods were not evident to the mathematical physicists, who had been accustomed to base their calculations simply on the laws of force, without concerning themselves with any medium to act as a vehicle of energy. They believed in the idea of action at a distance. Energy disappeared from one place and reappeared at another. They could form their equations without assuming the existence of any transmitting medium, and the solutions were in accord with observed phenomena. Fortunately Faraday had no such preconceived mathematical notions. He was not a mathematician, and was driven to invent a logic of his own; his tube of force took the place of the mathematicians' differential equation. These tubes of force were mathematical quantities, and his whole theory admitted of mathematical representation; but to bring his theory completely within the comprehension of the mathematical physicist needed an interpreter, who should express his ideas in their own familiar language.

Clerk Maxwell.

In 1831, when Faraday was just beginning his work on electromagnetic induction, James Clerk Maxwell was born in Edinburgh. Educated at Edinburgh, and afterwards at Cambridge, Maxwell graduated in 1854, taking the position of Second Wrangler. His original investigations began whilst he was still in his teens, when he contributed papers to the Royal Society of Edinburgh on "Rolling Curves," and on "The Equilibrium of Elastic Solids." Whilst an undergraduate at Cambridge he devoted himself more to research than to working for the tripos. It was during this period that he carefully studied Faraday's original papers. His inclination was always to study mathematics as a means whereby to express his ideas on physical subjects rather than as an end in itself. His private tutor, William Hopkins, said of him: "It is not possible for that man to think incorrectly on physical subjects."

In 1855 Maxwell wrote a mathematical paper on "Lines of Force," expressing the Faraday line of force in mathematical language, and still further developing the idea. In 1856 he was appointed to the chair of Natural Philosophy at the Marischal

PROFESSOR JAMES CLERK MAXWELL.

*(From the painting by Lowes Dickinson in the Hall of Trinity College, Cambridge.)*

College, Aberdeen. The same year he gained the Adams Essay Prize with a thesis on "The Rings of Saturn," in which he showed that Saturn's rings could not, consistently with stability of structure, be either solid or liquid, but must be of the nature of streams of meteorites revolving round the planet. About the same time he invented the "dynamical top" to illustrate certain problems in dynamics. In 1860 he read a paper at a meeting of the British Association on "The Kinetic Theory of Gases," which supposes a gas to consist of myriads of particles jostling

against each other. The theory is consistent with the experimental laws of gases, and gives an insight into their behaviour when subjected to various physical conditions. The first to treat the theory with exactitude was Clausius. He was followed by Maxwell, and by Boltzmann. The three contemporaneously rapidly developed it. Although the theory is on a firm basis it fails to account for the diversity of values of the ratio of the two specific heats in various groups of gases.

An important addition was made to our knowledge of the constitution of bodies when Andrews published his classical researches in 1869, showing the existence of a critical point in gases. He showed that at any temperature there is a pressure at which a gaseous body is in a state of transition, being neither liquid nor gas, but in an intermediate state, such that any increase of pressure will cause some liquefaction, and any diminution of pressure will be followed by a return to the gaseous state.

Much of Maxwell's time was given up to the study of composition of colours. He invented the colour-box for analysing and combining the different colours of the spectrum. Prior to this time, the three primary colours were thought to be red, blue, and yellow. With his colour-box Maxwell showed that this is not the case, but that the three primary colours are red, green, and blue. He showed also that a mixture of blue and yellow produces pink, and not green as is commonly supposed. For these researches on light the Royal Society awarded him the Rumford Medal in 1860. The same year Maxwell was appointed Professor of Physics at King's College, London. In 1866 he retired to his estate at Glenlair. In 1870 he published his "Theory of Heat," an elementary text-book without a parallel. The following year he accepted the Cavendish Professorship of Physics at Cambridge, and shortly afterwards he published his treatise on "Magnetism and Electricity," which is a mathematical treatment of Faraday's method. All electrical phenomena are explained by reference to energy stored up in the surrounding medium.

Maxwell called himself the interpreter of Faraday's views: but he was more than this; he built up a mathematical theory of magnetism and electricity which will be a lasting monument to his genius. He also propounded his electromagnetic theory

of light, in which he supposes that electrical energy is propagated by vibrations of the same æther which is supposed to transmit energy in the form of light. His theory supposes, in fact, that electricity and light are simply different aspects of the same phenomenon—a vibrating æther. In recent years Hertz, a pupil of Helmholtz, has, in a series of brilliant experiments, gone far towards verifying the results of Maxwell's theory of light. Electric waves have been obtained, and have been shown to be capable of reflection and refraction in exactly the same way as waves of light.

Maxwell died in 1879, and the scientific world lost its most brilliant genius.

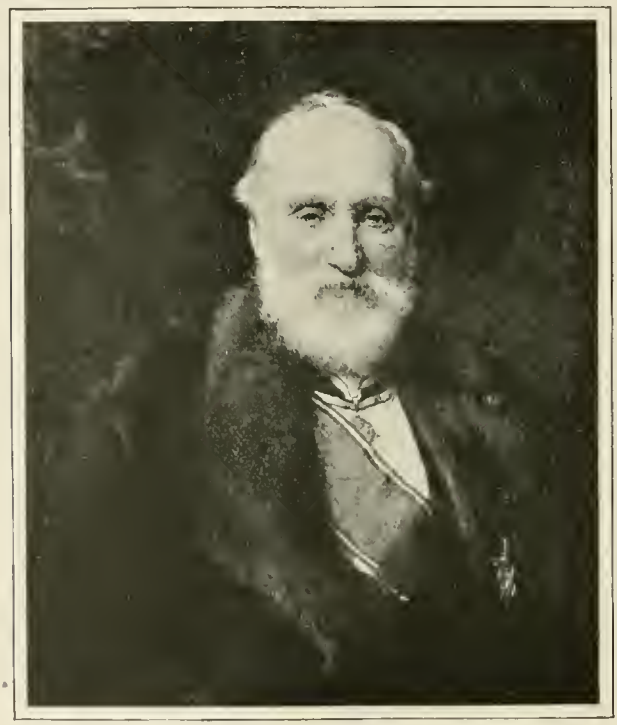
**Lord Kelvin.**

One of the first to appreciate Joule's researches was Professor William Thomson (afterwards Sir William Thomson, and, still later, Lord Kelvin). He was educated at Glasgow and Cambridge, and was Second Wrangler in 1845. In 1846 Thomson brought out his theory of "Electric Images," and in the same year was appointed to the chair of Natural Philosophy in the University of Glasgow. Like Maxwell, his original contributions to physical science began when he was still a boy in his teens. As a theorist he has done more than anyone to develop the principle of conservation of energy. In 1849 he published a dynamical theory of heat, based upon the researches of Joule. Three years later he deduced the principle of "Dissipation of Energy," or the tendency of the available energy of a system to diminish while the total energy remains unaltered.

It is as an inventor of electrical instruments that Lord Kelvin stands pre-eminent. Many of the most delicate instruments for the measurement of electrical quantities owe their origin to his inventive genius. In 1858 he brought out his mirror galvanometer, which is capable of detecting excessively small electric currents. Among his more important inventions are a mariners' compass, protected so as to be unaffected by the presence of iron in the body of the ship; his siphon recorder, an instrument for recording telegraphic messages; the electric balance, in which the strength of an electric current is measured by balancing the force of attraction of two coils through which it flows against the weight of a given mass; the absolute electrometer, by means of which the difference of potential of two discs

is found in absolute measure; the quadrant electrometer, for comparative measure of differences of potential, and other instruments, too numerous to mention.

The discoveries of Volta, Ohm, Young, Oersted, Ampère, Faraday, Joule, Helmholtz, and Maxwell opened out wide fields



LORD KELVIN, G.C.V.O., F.R.S., BY W. W. OULESS, R.A.
*(By permission of the Artist and the Worshipful Company of Clothworkers.)*

for scientific research, and almost all subsequent researches have been merely extensions and developments of the principles which these philosophers brought to light. Accurate measurements of the various physical qualities have been made, and refined instruments for delicate observations invented. In all branches of physical science measuring instruments have been brought to a wonderful degree of delicacy and perfection. The galvanometers now in use are a billion times as sensitive as the

old detectors of Ampère and Schweigger. Tyndall found it difficult to find instruments sufficiently sensitive to measure radiant heat in large quantities. Instruments are now in use by which the heat radiating even from the moon can be detected.

The Outlook.

There are many scientific problems still unsolved, waiting for another Faraday or Joule to come with heaven-born genius, and still further unravel Nature's mysteries. Will such problems as "What is æther, and in what way is it related to matter?" or, "What is the true nature of gravitation?" ever be solved? Problems like these are now occupying the minds of our greatest men of science. They may be solved in the near future; they may be beyond the powers of human understanding.

ROBER STEELE. Chemistry and its Applications, 1846-1885.

Chemical Manufacture.

The opening of the College of Chemistry in October, 1845, under A. W. Hofmann, marks in some respect an era in English chemistry, and is remarkable as an illustration of the way in which scientific researches which seem to be without any practical bearing often develop into the most important practical consequences. Since the discovery of benzene by Faraday in 1826 a number of allied substances had been discovered by various workers. Indigo, coal-tar oil, and other substances had been distilled, and under various names a substance ultimately called aniline had been obtained from them. Before coming to England Hofmann had proved the identity of these products, and other chemists had shown that aniline could be prepared from benzene. In this country Hofmann continued his researches on aniline, and discovered a number of bodies which, like it, could be considered as substitution derivatives of ammonia, and the methods he used have been of the greatest value in the development of the coal-tar industry. Among Hofmann's earliest pupils and assistants was W. H. Perkin. Under the direction of Hofmann, Perkin set to work on some bodies, anthracene and naphthalene, which have since become the starting-point for the production of very important colouring matters; but it was in attempting to carry out the artificial formation of quinine that Perkin discovered the colouring matter since so well known as mauve: this was in 1856. In 1857 it was first used commercially, and in 1862 a large

proportion of the colouring matters in use were aniline dyes. Yet in 1858 the following words could be used in an important text-book:—"The compounds of aniline are to be reckoned by hundreds, but they are not the subjects of manufacture: they are not articles of commerce: they are of no use in the arts; they are applied to no purpose in domestic economy." It would be long to trace out in detail the progress of this industry. The next important step was taken in 1868. Two German chemists in that year succeeded in producing for the first time the colouring matter alizarin (the dyeing matter of madder) from anthracene. Aware of the importance of this discovery, Perkin at once set to work, and, by the aid of his former knowledge of anthracene and its derivatives, discovered another method of producing the substance. Before the end of 1869 he had produced one ton of artificial alizarin; in 1870, 40 tons; in 1871, 220 tons, and so on. Twenty years after the birth of the industry the annual value of the colours produced amounted to over £3,000,000 sterling (1878).

**The Constitution of Chemical Compounds.**

Up to this point little was known of the constitution of chemical compounds. The type theory had proved of considerable assistance, but science was as far as ever from understanding what part organic radicals took. The next advance in theory was due to Frankland (1825–1899), afterwards Sir Edward Frankland, and Kolbe (1818–84). Bunsen had discovered a remarkable compound in which arsenic entered into the composition of an organic body. Extending these researches, Frankland described a series of compounds in which tin took part in the formation of an organic body, and was led to deduce the doctrine of valency—*i.e.* that the combining powers of any element were fixed or satisfied always by the same number of atoms. Kolbe's work after this principally lay in the discovery of the constitution of organic compounds. In 1858 Cannizzaro, an Italian chemist, published a paper which finally formulated the opinions of chemists on the methods employed for obtaining the atomic weights of the elements. The greatest achievement of the doctrine of valency was the explanation of the structure of benzene and the so-called aromatic compounds by Kekulé (b. 1829) in 1865. From his formula Kekulé was able to predict the number of isomeric compounds that could be produced from benzene and its derivatives,

and threw great light not only on these derivatives, but on substances like naphthalene and anthracene, which were now beginning to be important commercially.

Classification of the Elements.

Soon after the benefits derived from the classification of organic compounds were observed, numerous chemists set about the task of finding some principle of classification of inorganic substances. It was readily seen that many of these substances fell into groups the members of which greatly resembled one another, while the differences between their atomic weights approached multiples of some constant. Schemes for the classification of the elements began to appear. In 1864 Newlands in England and Lothar Meyer in Germany independently arranged a number of the elements according to their atomic weights, and observed a certain periodicity in the behaviour of the elements. In 1869 Mendelejeff made an attempt to classify all the elements according to their atomic weight and bring them together into a natural system. The periodic law thus formulated has received many confirmations. Gaps in the system have been filled up by the discovery of elements whose atomic weights and physical properties were accurately predicted, and of those elements which did not fit into the system the atomic weights have been re-examined and found inaccurate. The law that lies underneath this dependence of chemical bodies on their atomic weights has yet to be discovered, but it is not to be wondered at that many chemists have turned to the ancient theory of one primary matter as an explanation.

Photography.

Of late years the development of chemistry has been so rapid that even a mere catalogue of its branches would occupy much of our space, but one of these developments, resulting as it has in photography, is of general interest. Boyle had noticed the blackening of silver chloride when exposed to light, though he attributed it to the air, and Scheele (1742–86) studied the action of the spectrum on paper soaked in chloride of soda. The discoveries of Daguerre and Talbot about 1838 led to the foundation of photography: Daguerre, in his process, received the image produced by the lens on a silver plate, and made it visible by means of mercury: Talbot replaced the silver plate by paper. In 1847 glass negatives coated with albumen were introduced. In 1851 collodion was introduced, and in

1871 bromo-gelatine plates were introduced and practically revolutionised photography. From that time to the end of our period the improvements were mainly optical and mechanical. Another important use of light in chemistry has been the development of the process of spectrum analysis, which, in the

A VERY EARLY PHOTOGRAPH.
(*Fox Talbot: "Pencil of Nature,"* 1844; *Plate XIV.*)

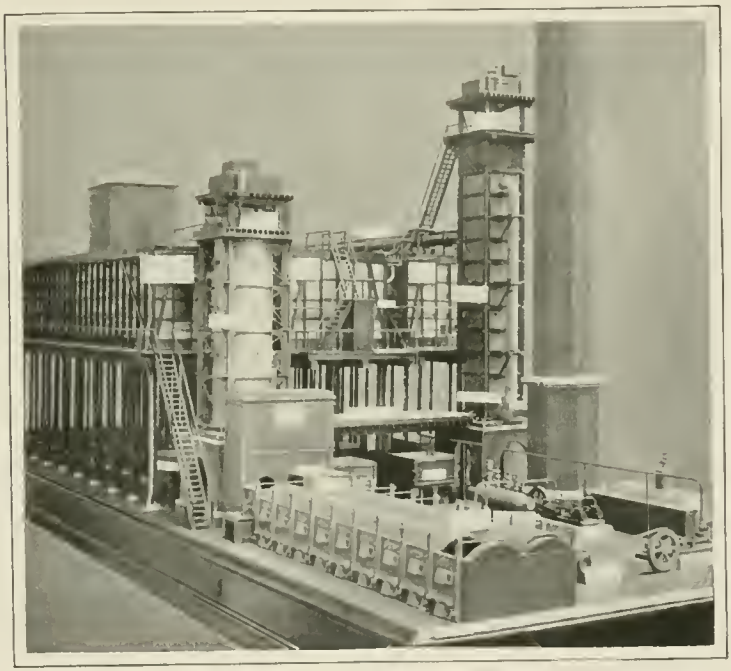
hands of Bunsen, Roscoe, and Crookes, has led to the discovery of new elements and has rendered important service to astronomy.

**Chemical Industry.**

The growth of chemical industry during the century has kept pace with chemical theory. Metallurgy was the first to benefit; the analysis of furnace gases by Bunsen and Playfair, and the determination of the composition of pig-iron, explained the theory of the blast furnace, and made possible such improvements in the manufacture of steel as the Bessemer

process (1856; p. 745), and towards the close of our period, the Thomas-Gilchrist process, by which large amounts of practically useless ore have been rendered available, and its very impurities made into a substance of the highest value (p. 747).

The manufactures of sulphuric acid and soda may be looked upon as the basis of all others from their extensive use and the



MODEL OF SULPHURIC ACID PLANT.
(*Victoria and Albert Museum.*)

bye-products formed in the course of their production. The manufacture of sulphuric acid in this country dates from 1746, when the first lead chamber was erected at Prestonpans: the manufacture of soda from common salt dates from 1823, and that of bleaching-powder from 1779. The improvements of this century are principally in the direction of more economical and scientific working of the processes; the only other has been that of the introduction of iron pyrites as a source of the sulphur required instead of using native sulphur; an improvement

forced upon British manufacturers in 1838 by the King of Naples, who had granted a monopoly in sulphur. The manufacture of soda from common salt was first discovered by Leblanc at the close of the eighteenth century, but it was not until the salt duty (£30 per ton) was repealed in 1823 that alkali works were set up in Liverpool by Muspratt. The chief important improvement in this process is due to Hargreaves (1877): by it sulphate of soda is prepared directly without the use of sulphuric acid. The chief drawback of the Leblanc process is the loss of sulphur in the unpleasant alkali waste, and of late years an entirely different method of manufacture has been adopted, by which ammonia obtained from gas liquor is injected into the brine solution. Carbonate of soda is at once formed, and from the bye-product ammonia can be recovered and again used. The principal drawback to this process is that the chlorine of the common salt is set free in a form in which it cannot be used for the manufacture of bleaching powder, and thus the Leblanc process continues to be worked.

D'ARCY POWER. Medicine and Public Health.

Contemporary writers too often consider that the advances made in their own day are of superlative importance. The contemporaries of Phidias at Athens, of Lorenzo the Magnificent in Florence, and of Shakespeare in London, might justly boast that their ages were exceptional in the history of the world; but we cannot yet say whether, in spite of steam and electricity, our own times will prove to be equally important in the eyes of our successors. In medicine, as in science generally, this is an age of detail and of criticism. Countless facts are being daily observed and carefully recorded by numerous observers in every branch of medicine. Experiment, too, has afforded results of the greatest value, for it has enabled our science to be built upon the surest foundations: but a master mind is still needed to correlate our facts and to deduce from them hypotheses as far-reaching and as fruitful as those which Darwin gave to biology.

Medical Education.

Many great advances were made by the medical profession during the twenty years under review, but the education of its students remained almost as chaotic as in 1858, when the first Medical Bill became law. Apprenticeship and practical

teaching were then replaced by an elaborate series of lectures. Medicine, surgery, and midwifery were taught piecemeal, and it was possible for a student to become legally qualified to practise his profession after he had been found proficient in only one of these subjects. Such an abuse was of long standing, for as early as 1588 John Read, a liberal-minded surgeon, had complained that

> "Chirurgery is maymed and vtterlie imperfect without those other partes which consisteth in prescribing of inward medicines and conuenient diet, and is so neare linked with these in alyance that no man deserueth to be called a chirurgion that is ignorant in phisicke . . so . . . that . . I doe withall affirme that all chirurgians ought to bee seene in physicke; and that the barbor's crafte ought to be a distinct mistery from chirurgery."

The latter suggestion was adopted in England as early as 1745, but it was not till 1886 that it became compulsory for everyone to be examined in each of the main branches of his profession before he was permitted to practise upon the public. This wholesome regulation had been foreshadowed in the Medical Act of 1858, which permitted corporate bodies possessed of the power of licensing in a single subject to combine with other bodies to give a complete licence after a joint examination, but it did not become an accomplished fact for many years afterwards. Such an amalgamation, however, had been adopted temporarily by the physicians and surgeons of London in 1421.

The fundamental defect still (1904) exists that no uniform standard of education is required of a medical student. High degrees conferring social distinction may be obtained after a fair examination of no great severity, whilst a much more searching test may be applied to candidates for a mere licence. The medical student, too, is harassed by constant changes in his curriculum, and so much detail is now required of him that he is more inclined to accept the *ipse dixit* of his teacher than to think for himself. Dogmatic teaching is, therefore, in high favour even with the best students, and there is some danger of authority again assuming a position in medicine, though it is hardly conceivable that it will ever exercise its former benumbing influence. It seems probable that we are passing through that phase in medicine which has already been traversed successfully by botanists, zoologists, and anatomists,

to whom classification, form, and the relation of parts once appeared to be the sole outcome of a vast amount of labour. Classification, indeed, still forms the basis of all these sciences, but a superstructure has been grafted upon it which enables students to be taught with a minimum of detail. The teaching of the sciences ancillary to medicine will in all probability follow the same lines, as they will be taught by types, but the healing art must always be taught from individual cases, for each body is peculiar to itself.

Medical education has shown a constant tendency to become more thorough and more complete, whilst the duration of its curriculum has been gradually lengthened from three to five years. The advance of education amongst women has led a certain number to enrol themselves in the medical profession. The movement was at first bitterly opposed, and a severe battle had to be fought by the female medical students before they could obtain a licence to practise. They overcame successfully the various obstacles thrown in their way, and in 1874 the London School of Medicine for Women was opened, whilst two years later a short Act of Parliament was passed enabling the names of properly qualified women to be placed upon the register.

The Royal Colleges of Physicians and of Surgeons have moved steadily with the times, though their progress has not been so rapid as some of their more democratic supporters would desire, for the corporate bodies of England are, and always have been, oligarchies.

**Medicine and the Applied Sciences.**

Medicine has become more prophylactic. Improved knowledge of personal and general hygiene has led to a marked increase in the average longevity, as well as in the number of people who survive the diseases and accidents of childhood. The growth of physiology into an experimental science has greatly aided the advance of medicine from its former empirical position, whilst the more careful study of morbid anatomy with improved methods of physical examination have led to the greatest accuracy in diagnosis.

Therapeutics have hardly advanced in the same proportion, though pharmacology is now a branch of experimental physiology. The improvement in chemical processes has enabled the physician to lay aside the old and cumbersome method of

administering drugs by infusions, decoctions, and powders, for the crude drug is now replaced by its active principle. The first result of this improvement has been to diminish the doses of medicines and to allow them to be administered in more agreeable forms, whilst it has been found possible to inject many drugs beneath the skin, thereby avoiding the evil effects produced when they are taken by the mouth.

Pathology, too, has become a branch of experimental physiology, and of late years has been advanced in a very remarkable manner by the highly-suggestive work of Lister, of Pasteur, and of Koch. The labours of these three great investigators have shown that an intimate knowledge of pathology is as important and useful to the physician and to the surgeon as a thorough acquaintance with morbid anatomy.

*Photo: Elliott & Fry, Baker Street, W*

LORD LISTER.

Antiseptic surgery owes its origin to Sir Joseph (afterwards Lord) Lister, who showed that decomposition did not take place in wounds kept absolutely clean, if the air coming to them was filtered from all living germs. As soon as he had converted this theory into an established fact, it spread rapidly from the pathological laboratory to the operating theatre, where it enabled the surgeon to revolutionise his practice and to extend his domain. It revolutionised his practice by reducing the gravity of all surgical procedures, thereby allowing him to operate at a much earlier period than was thought formerly to be advisable. It extended his domain by enabling him to operate upon those parts of the body which had hitherto remained untouched on account of the violent and fatal inflammation which had usually followed upon any surgical procedure by the older methods. While Lister's work benefits the individual, the labours of Pasteur have proved serviceable to the community, for they have yielded results of great prophylactic

value, and have afforded a clue to the prevention of some of those diseases which spread in epidemic form. One—amongst many—of Koch's results has yielded a rational knowledge of tuberculosis, and has shown that consumption in all its protean forms is constantly associated with the presence of a single variety of micro-organism. This discovery proved to be of the utmost importance, for it was the foundation of the science of Bacteriology.

State Medicine.

Hygiene has progressed steadily, for the State has shown an increasing tendency to concern itself with the public health. The Royal Sanitary Commission of 1869–71 established the principle that members of the medical profession should be made serviceable in administering the health laws. The Local Government Board, with Mr. Stansfeld as its President, was established in 1872 as a direct outcome of this Commission. Medical officers of health were then appointed throughout the country. They are empowered to deal with all matters likely to affect the health of the community, and they are paid partly by a rate, partly by grants from the Exchequer. The ignorance and apathy of the local authorities at first went far to neutralise the benefit of the skilled assistance thus rendered available, but better counsels have since prevailed, and the law is now in fair working order. Many members of the medical profession have taken advantage of the new opening thus provided for them, and have accepted the somewhat onerous duties of health officers, for the faithful discharge of which they have endeavoured to fit themselves by a special course of instruction.

Public Health.

The steady decline of typhus even to a vanishing point is one of the most satisfactory results which has to be recorded in connection with the public health of the last twenty years. The diminution of this disease appears to be the direct outcome of the improved sanitary conditions under which the poorer classes are living, and to the higher standard of comfort which they now demand. Smallpox, like typhus, also appears to be a waning disease. It is, indeed, still endemic, and from time to time it becomes epidemic, but the number of deaths is no longer a striking feature in the returns of the Registrar-General. The practice of vaccination was rendered compulsory in 1853, and it became uniform after 1865, when an organised inspection was established throughout the country, and was

conducted by officers placed first under the control of the Privy Council and afterwards of the Local Government Board. The operation was further controlled, and was rendered more complete, in 1868, when the public vaccinators began to be paid by results.[1] Typhus fever, typhoid, and smallpox have diminished, but other diseases have increased, and foremost amongst these are diphtheria and cancer. Pathology has recently found a means of minimising the fatal effects of diphtheria, but we are, as yet, wholly ignorant of the true nature and the best treatment for cancer.

Lunacy. Lunatics have shared in the more moderate and rational treatment which has marked the professional work of the present century. The scourgings and chains which from time immemorial had fallen to the lot of these unfortunate individuals in Western Europe began to attract the attention of the Quakers at York at the end of the last century, a few years before Pinel had begun his reforms in Paris. Little, however could be done even by such men as the Tukes, for the force of public opinion was still in favour of harsh treatment. Mechanical restraint continued, and it was not until Dr. Conolly was appointed resident physician to the Middlesex County Asylum at Hanwell, in 1839, that a public asylum existed without any form of mechanical restraint for its patients. The Hanwell Asylum, justly considered one of the best-managed in the kingdom, contained about 800 patients, for whose use, as Dr. Conolly found on his appointment, no less than 600 instruments of discipline had been provided, about one-half being handcuffs and leg-locks. These, with the strait-waistcoats and coercion-chairs, he abolished in favour of kind treatment upon the part of the physicians and attendants, coupled with a sufficient staff properly trained to carry out their duties in a humane manner. His system soon became world-wide, and its beneficial results are everywhere to be seen in the quiet and routine which pervade the wards of all our asylums, in strange contrast with the accounts of Bedlam and St. Luke's which have been

[1 The exemption of "conscientious objectors" or their families was, however, legalised in 1898 (61 and 62 Vict., c. 49), after a long period of that "passive resistance" which was called out more conspicuously by the Education Act of 1902. At the same time provision was made for vaccination by calf-lymph in all cases, and one of the gravest objections to the operation—the danger of the transmission of disease from patient to patient by its means—was thereby removed.]

transmitted to us from the middle of last century. Medical men are now specially trained in the subject of mental diseases, with the result that a much better system of classification is in use, and that asylums have been founded for the reception of idiots of the middle-class, whilst quite recently a colony of epileptics has been established to enable these unhappy people to work under the most advantageous conditions. Increased knowledge of mental disease has led to the necessity for increased protection both upon the part of the patient and of the practitioner who certifies to his insanity. The law in connection with lunacy has long been in a most unsatisfactory condition, for it was full of contrary precedents, and it appeared to press with undue harshness upon the medical man who certified to a patient's insanity. A new Act, however, was passed in 1890, which enabled him to sign certificates in such cases with less danger of being afterwards cast in damages.

A LUNATIC EARLY IN THE NINETEENTH CENTURY.
(*From a sketch by G. Arnold, A.R.A.*)

The practice of dentistry in 1841 was in much the same condition as that of surgery in 1565, when John Halle confesses that—

**Dentistry.**

> "Where as there is one chirurgien that was apprentise to his arte, or one physicien that hath travayled in the true studie and exercise of phisique, there are tenne that are presumptious swearers, smatterers, or abusers of the same: yea, smythes, cutlers, carters, coblars, copars, coriars of leather, carpenters, and a great rable of women."

An attempt was made in 1841 to obtain public recognition for dentistry as a branch of surgery, and negotiations were opened with the Royal College of Surgeons to obtain an

enactment that no one should practise as a dentist until he had been duly examined by one or more members of that body. The negotiations failed, although the support of the Government had been obtained in the person of the Home Secretary, Sir James Graham. A second and more successful attempt was made in 1855, and in the following year the College was

EARLSWOOD ASYLUM, REIGATE—COBBLING.

memorialised upon the subject, the Odontological Society was founded, and the *British Journal of Dental Science* was published. The College of Dentists of England was established about the same time. It was an independent organisation, whose promoters desired that dentistry should be free from any association with the Royal College of Surgeons, and it proceeded to examine candidates and grant licences in dentistry. It existed for seven years, and amalgamated in 1863 with the Odontological Society. As an institution it is now defunct, and the Royal College of Surgeons of England fills its place. The Odontological Society is a society of qualified dentists

established for purely scientific purposes. The dentists gradually obtained a course of sound technical instruction verified by examination, for in 1858 the Dental Hospital of London was founded, and in 1860 the Royal College of Surgeons began to examine candidates for a licence in dental surgery. This course of instruction was purely voluntary at first, nor was it rendered compulsory until 1878, when a special Act of Parliament placed dentists upon the same footing as other members of the medical profession. It established a register of those qualified to practise their art, and it prohibited unlicensed persons from assuming any title implying that they were qualified to practise dentistry. In 1880 the British Dental Association was incorporated. The Association consists of the qualified dentists of the United Kingdom, and the objects for which it is established are the promotion of dental and the allied sciences and the maintenance of the honour and interests of the dental profession.

Nursing.

The great improvement in nursing is, perhaps, one of the most remarkable developments in connection with the history of medicine in our own times. Taking its rise in the Crimean War, with the laudable object of mitigating the horrors of a campaign, nursing rapidly became a profession. Confined for a time to the military hospitals, it spread to the civil institutions of the country, which then became the training schools from which private individuals and the poor in their own homes might obtain the services of highly-qualified and often of socially-gifted women to perform the various duties of the sick-room.

The decay of hatred is as marked in the medical profession as it is in the political world. Medical men used to entertain the most violent animosity, not only for each other, but even for those who endeavoured to make their views known to the rest of the profession. Teaching was almost entirely oral at the beginning of this century, and medical journalism was then at a very low ebb. The College of Physicians, the Provincial Medical Association, and a few societies, tried to diffuse knowledge by the publication of "Transactions," and as early as 1781 a Society of Physicians who met together occasionally to converse on medical subjects agreed to set on foot a monthly publication, which should contain an account of new medical books and useful discourses in physic, whilst it was at the

Medical Journalism.

A WARD IN GUY'S HOSPITAL.

same time a repository for original essays. This venture was continued quarterly until 1790, and it was known as the *London Medical Journal*. The new era of medical journalism began on Sunday, 5th October, 1823, when Thomas Wakley published the first number of the *Lancet*. Its beginnings were by no means creditable. There were doubtless plenty of abuses to combat, for the large hospitals were practically close boroughs as regards the staff appointments. The medical officers in each were recruited from apprentices who had paid fees of £500 to £1,000 to the physicians and surgeons on the tacit understanding that they should have the reversion of their places; but the means adopted by the *Lancet* to correct abuses were most unjustifiable. Personal attacks, nicknames, and gross abuse were so often employed that the journal was tabooed for a time even by those members of the profession who were sufficiently enlightened to understand the true value of this new means of diffusing knowledge. Quarterly journals then appeared, but, with a few useful exceptions, all the quarterlies are now extinct. The weekly journals have continued, and, by a slow process of evolution, have become transformed into their present highly respectable shape. Monthly journals, too, have arisen in great numbers, for their growth has been stimulated by the increasing tendency towards specialisation which has marked the progress of medicine.

We thus bring to the year 1885 the history of medicine in this country. The ranks of the medical profession contain, as they always have done, men of the very highest scientific attainments, who devote their lives to the assistance of their fellows irrespective of creed or of nationality; empirics, or men who neglect and disclaim science; tradesmen, for whom the profession is a more or less lucrative business; and quacks, who dishonestly make physic a means of preying upon the credulity and fears of their fellow-men. Quacks, indeed, become fewer as time progresses and knowledge increases, but with keener competition the number of the tradesmen is augmented. Education has a constant tendency to exterminate, or rather to hinder the development of, the empiric or mere pretender to physic; but the scientific physicians daily increase in number, though the best minds in the profession are too often seduced to the study of pure science.

THEORY and practice in real life actually work in parallel courses, the one rarely far in advance of the other, each unable to expand its limits without encroaching on those of its neighbour. Their correlation is well marked in the history of engineering. Electrical engineering is dealt with elsewhere (p. 783 *seq.*), but the causes and general direction of the advance in mechanical and civil engineering may be suitably discussed here. O. G. JONES. Engineering, 1815-1885.

Mechanical engineering is more than a branch of the subject. It is essentially the application of mechanical principles to the construction of engines for the transmutation of energy, or of machines for its transmission. We may apply electricity, heat, water-power, or any other source of energy, and find ourselves continually requiring the training of the mechanician before we can realise our aims.

The Conservation of Energy.

The great advances in constructional processes in this country may well be studied with the development in our knowledge of the physical sciences. We may illustrate this first in the case of the principle of the conservation of energy (pp. 258, 704). Its recognition has been but gradual. At the beginning of the century some few leading physicists had begun to realise that a disappearance of energy in one form was simultaneous with its appearance in another. Rumford formulated the doctrine with reference to heat as a form of energy. Davy upheld it, and successfully combated the caloric theory then generally accepted. Joule, Helmholtz, and Lord Kelvin have since completed the work (p. 711), and placed the dynamical theory of heat so that succeeding experiments never fail to strengthen its position. The energy stored up in coal is converted to heat energy in the process of combustion, and transferred, with various losses, to steam. This is made by suitable engines to yield up some proportion of its heat energy for conversion into mechanical motion. More energy than the coal supplies it is impossible by any device to obtain as energy of motion, and engineers, with a clear realisation of this principle, have abandoned all schemes for the solution of the perpetual motion problem. A physicist, therefore, criticises all steam-engines or other sources of power in the light of their physical efficiency. So much energy is supplied to them in one form; what percentage is given out in another desired

form, and how may improvement be effected? In different classes of motors the designer has to consider mechanical efficiency. He aims at the elimination of friction in the working parts: he employs methods of construction that will give great power for a small total weight, and equal but not unnecessary strength in each portion of the structure, great durability in those parts that cannot easily be renewed, and facility of access for those that need frequent examination or renewal. In special cases one or the other of these considerations becomes of paramount importance; the rest are often negligible.

**The Compound Engine.**

It was pointed out by Sadi Carnot in 1824 that the efficiency of any heat-engine has its maximum limit fixed by the range of temperatures employed with the working substance. Thus of two otherwise similar engines, working with the same temperature of full-pressure steam, that is the more efficient which can run to a lower exhaust temperature: it utilises a greater percentage of the heat supplied. Likewise a raising of the temperature of full-pressure steam is accompanied by an increased efficiency.

Here, then, we have the ultimate reason for the movement among steam engineers in favour of steam at very high temperatures, with prolonged expansion in low-pressure cylinders till considerations of space economy forbid further abstraction of the energy yet remaining in the steam. Double-expansion was first introduced in stationary engines: triple and quadruple expansions are now exceedingly general, and are applied with great success in marine engineering (pp. 460, 464).

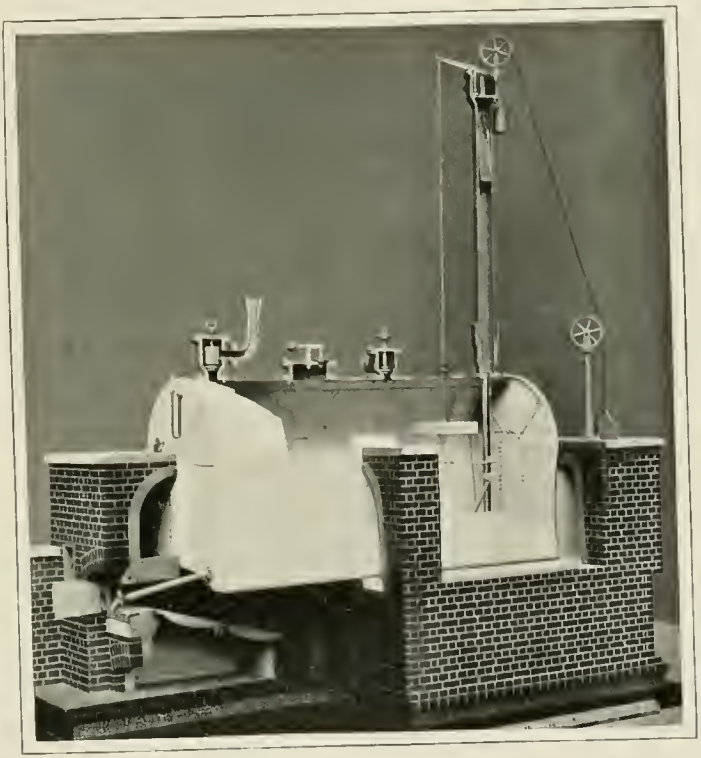
**Boilers.**

There thus enters another question of grave importance, that of the strength of boiler, cylinders,[1] and accessory connections capable of withstanding the enormous internal pressure of the steam at so high a temperature. Were it not for the improvement in quality and adaptability of steel and iron, engines working with steam at 180° Centigrade could not be built of sufficient strength and durability. Until quite recently the strength problem has been attacked directly. Steam boilers have been developed step by step to their present form; methods of strengthening and of accelerating the generation of

[1 The application of the turbine to marine engineering belongs to the beginning of the twentieth century.]

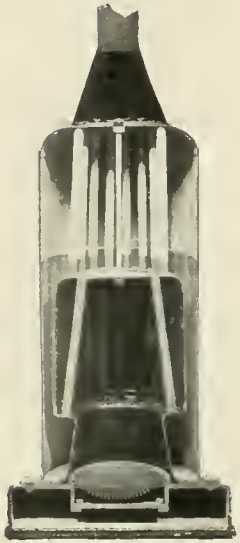
steam have made parallel advances, and no links are missing in the connection between the old waggon boiler for stationary engines and that of a modern locomotive.

Until 1885 steam boilers were built almost exclusively of wrought-iron plates, riveted by hand. With the introduction



MODEL OF A WAGGON BOILER.
(*Victoria and Albert Museum.*)

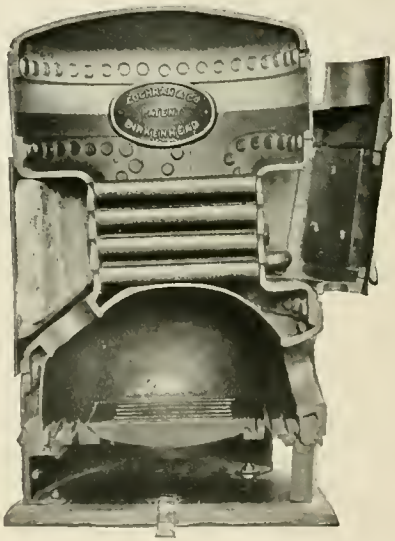
of steel came the employment of mild steel boiler-plates, fairly reliable when the plates are not too large. Nevertheless, to this day it is impossible to ensure perfect homogeneity throughout the plate, and in all important work there are Board of Trade regulations for the testing of samples from each plate supplied. The old hand-riveting was better than any kind of modern machine-work, but very much slower. It is resorted to nowadays in large works only when the rivet is inaccessible to



MODEL OF RICHARDSON'S VERTICAL BOILER.
(*Victoria and Albert Museum*)
*By permission of Messrs. Robey & Co.*

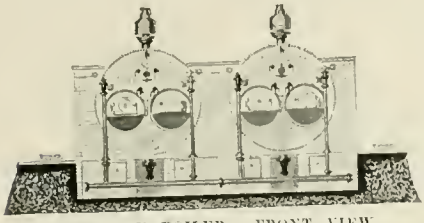
the machine, or when particular care is needed. Also the old-fashioned method of drilling the rivet-holes was much less injurious to the boiler-plate than is the hydraulic punch now used. An extensive modern practice consists in punching a hole through the plate, and then rymering it out to a slightly larger diameter; this, for the most part, obviates injury to the plate.

Without strengthening stays of any kind a cylindrical boiler is weakest at its flat ends. Its curved surface needs no staying, for the boiler plates are made of sufficient thickness to withstand the internal pressure, which, moreover, has no tendency to distort the plates. The principle of strengthening the ends, while at the same time rendering the boiler more effective by the use of a number of small flue-tubes, is due to M. Seguin in France, and to Booth in England (1829). George Stephenson appropriated the idea and adapted it to his "Rocket," the success of which in the Rainhill competition (p. 276) was partially the cause of the association of multitubular boilers with his name. He should only get credit for his rapid perception of their efficacy. Such a boiler, with perhaps two hundred copper tubes running from end to end, is enormously strength-



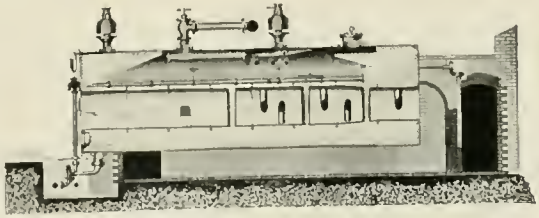
MODEL OF COCHRAN'S BOILER.
(*Victoria and Albert Museum.*)
*By permission of Messrs. Cochran & Co.*

ened by them and rendered far more efficient thermally by reason of the increased heating surface and diminished thickness of the metal used. It was no new idea to have the flue passing through the boiler, but it marked an acute realisation of principle to have many small flues instead. With the same resistance to collapse, they can be made of much thinner material than the single flue; they are readily cleaned and easily renewed when worn out.



LANCASHIRE BOILER: FRONT VIEW.

Consider for a short space the so-called Cornish and Lancashire boilers. They have one or two large flues leading through from end to end, the furnace being practically an enlargement of one end of a flue. Such large flues subjected to great external pressure from the contents of the boiler are liable to sudden collapse when any portion is thinned down by gradual burning. It is undesirable to have them of thick metal, inasmuch as the burning is more vigorous and the conductivity less. The introduction of Galloway tubes in 1867, which stretch across the flues, and through which the boiler-water can circulate, admirably illustrates the double object of strengthening against collapse and of increasing the heating efficiency.



LANCASHIRE BOILER: SECTION.
(*Victoria and Albert Museum.*)
*By permission of Messrs. D. Adamson & Co.*

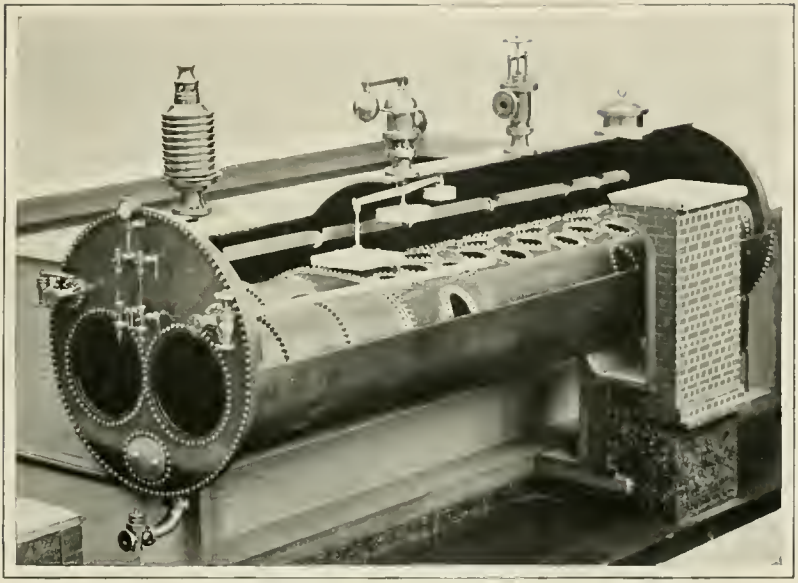
During the last few years[1] another plan of steam-generation at high pressure has been introduced, the theoretical consideration of which may be approached with advantage, though it is out of place here to discuss the subject at any great length. Given two copper tubes of the same thickness of material, the diameter of one being half that of the other, then the one can

[1 Written in 1896.]

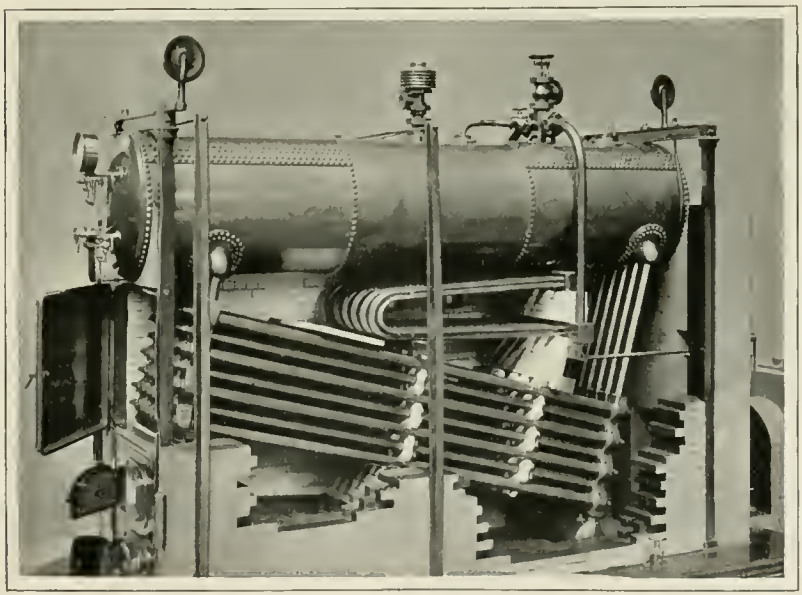
sustain an internal fluid pressure twice as great as the other. The generalisation is correct that further diminution in the internal diameter will be associated with a corresponding increase in the strength. So for the smaller pipe to possess the same strength in resisting an internal fluid pressure it needs but a proportionately diminished thickness. If the two tubes of different diameters be surrounded by furnace-gases, and be of equal strength, the contents of the smaller tube will be heated more rapidly because of its relatively slight thickness. Or, looking at the fact from a different point of view, if they be made of the same thickness of copper, the smaller can safely contain steam at a greater pressure. It is true that the smaller pipe has a smaller capacity, but this is remedied without loss of the previous advantages by using a greater length of tube.

Considered alike from the strength or heat-efficiency point of view, a steam-generator constructed on a tubulous principle, with no large internal space, has obvious advantages. Such a tubulous boiler with heat supplied to it at a steady rate, can be used for high steam temperatures, so offering a means of approaching the theoretical ideal of a heat-engine (p. 730). It is likely enough that the problem of flying will soon be solved by its aid.[1] In locomotive engineering it has been necessary to consider economy of power in relation to weight of the engine. An old Watts stationary engine with a bricked-up Cornish or Lancashire boiler was more efficient in poundage of fuel per horse-power per hour than a modern locomotive, but offered the locomotive engineer little help in his designing. He has been tied down to conditions of extremely rapid generation of steam by forced draught, to a uniform gauge of rails throughout the country, and a limiting weight of engine per foot length. It may here be remarked that the boilers of torpedo-boats are built on the locomotive pattern. In the earlier history of railways in the country, the "Battle of the Gauges" (p. 280) demonstrated the testing of theory by experiment on a gigantic scale. The questions of initial outlay in permanent way, stability of oscillations of the engine, effect of wind-pressure on an enlarged engine-front, balancing of stresses in the framework, together with the greater comfort of passengers with wider railway carriages—all these were subjected to examination, with the

[1 Petrol and electric motors have been developed since this was written.]



MODEL OF A GALLOWAY BOILER (IN SECTION).



MODEL OF A TUBULOUS BOILER.

(*Victoria and Albert Museum.*)

ultimate result that the ordinary gauge of 4 feet 8½ inches was adopted. The last of the Great Western Railway broad-gauge system was seen in 1895, and, except for lines with excessive gradients and sharp curves, there is now complete uniformity of gauge throughout the country.

**Compound Locomotives.**

The most daring advance in locomotive practice is due to Webb, who in 1881 applied double-expansion to London and North-Western railway locomotives (p. 289). The exhaust steam from the high-pressure cylinders passes into a larger low-pressure cylinder symmetrically placed between them, and there undergoes further expansion in actuating the piston. The engine is somewhat heavier; its centre of gravity is raised; but the difficulties of arranging the mechanism in the smaller available space below the boiler without impairing the stability of the structure have been overcome satisfactorily, and there is a saving of 15 to 20 per cent. in fuel.

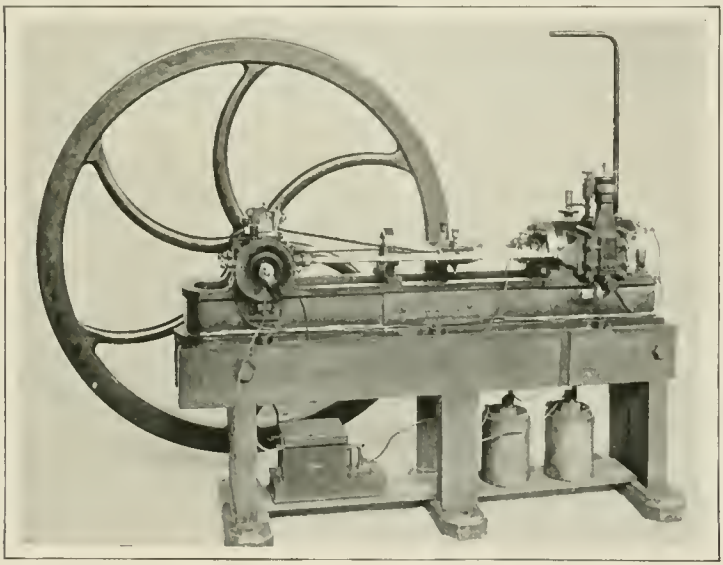
**Gas and Oil Engines.**

In internal combustion engines the working substance is heated by its own combustion in the motor cylinder. No furnace is therefore required. The efficiency of the engine itself is much higher than that of the steam-engine, mainly on account of the greater range of temperature employed. The best known types are the gas- and petroleum-engines. The first practical engine of this kind was invented by Street in 1794. It was worked by the combustion of vaporised petroleum oil and turpentine. In 1823 Brown introduced the water-jacket to keep the cylinder cool and prevent its rapid degradation due to heat. The Lenoir engine of 1860 showed a marked advance. Otto introduced in 1863 a very efficient, but noisy and mechanically defective gas-engine, which he superseded in 1876 by his famous "Otto Silent" engine, since that date a powerful rival to small steam-engines. It uses ordinary gas mixed with sufficient air for complete combustion. When working at full power the mixture is exploded every two revolutions of the fly-wheel. The gas reaches a temperature of about 1,600° Centigrade, and a pressure of over 100 lb. per square inch. It uses only 24 cubic feet of ordinary gas per horse-power per hour. If a specially prepared cheap gas be used—the Dawson gas—the consumption works out at 1·3 lb. of coal per horse-power per hour. In large marine engines for ocean-going vessels, where economy of fuel is specially considered, a result of 1½ lb. of coal per horse-power per

hour is regarded as satisfactory. Small steam-engines are never so economical.

Civil Engineering.

Reviewing the advances made in civil engineering, we see how much has been due to improvement in materials of construction, facility of transport and manipulation of heavy masses, the adoption of special tools and labour-saving machines for abrogating manual labour. Every piece of work becomes a



LENOIR'S GAS ENGINE.
(*Victoria and Albert Museum.*)

reference for subsequent engineers engaged on similar operations, who often reduce their average design to a close copy of an earlier one that has survived the test of time and usage. Epoch-making constructions are those that initiate on a large scale the application of special engineering principles. There was no previous history to assist the engineers of the Kilsby tunnel on the North-Western railway, in 1833; no suspension bridge to act as a model for Telford in his design for spanning the Menai Straits; no box-girder like the Britannia tubular bridge (1850) for Robert Stephenson, excepting, indeed, his own smaller structure over the Conway river. Masonry dams were practically new to England when the Vyrnwy reservoir was

constructed for the Liverpool water-supply. The Forth Bridge was the sole representative of the cantilever system, when finished in 1890 by Messrs. Fowler and Baker; and the Tower Bridge over the River Thames yet remains the largest bascule (or drawbridge) in the world.

Tunnelling.

Tunnelling and excavation are not so extensively employed in this country as abroad, for the obvious reason that its surface offers fewer inequalities that cannot be surmounted. But vested interests have often compelled direct routes for railways or for roads, when slight *détours* would have vastly diminished the duration and expense of the undertaking. The graver difficulties are due to the obstruction of hard rock, or of subterranean springs and quicksands. The former have been for generations attacked with gunpowder. The most usual explosives employed are gunpowder, nitro-glycerine, and gun-cotton. Nitro-glycerine in the form of dynamite is now effective and safe. The blast-holes in the rock are made by rock-boring machines, of which the prototype was introduced by Sommeiller in the Mont Cenis tunnel. The earliest form of diamond-drill, in which the crown of the borer is edged with a series of black diamonds, was described at the British Association Meeting of 1846.

Great risk is incurred when water floods the work. The Kilsby tunnel was cut through a sandbed, from which it was necessary to pump continually some 2,000 gallons of water per minute to prevent flooding of the tunnel. The Stephensons had charge of the works, and all their ingenuity and enterprise were called into action to construct the tunnel walls water-tight. In the construction of the Severn Tunnel (1873–85), which passes under the river near Chepstow, and which has a length of $4\frac{1}{3}$ miles, a large spring was tapped that necessitated the erection of permanent pumping engines to keep the tunnel clear. The diving operations during the undertaking were by far the most venturesome and extensive of their kind.

Bridges.

The modern engineer has found it necessary to cultivate an eye for beauty. Even a high-speed vertical engine is open to derision if it takes on the semblance of a coffee-pot, and in the important matter of bridge-design the public taste should be considered seriously. Robert Stephenson's realisation of the strength of the box-girder should not have prompted him to

*Photo: York & Son, Notting Hill, W.*

The Tower Bridge

*Photo: C. Vaughan, Acton, W*

Telford's Bridge across the Menai Straits.

*Photo: C. Vaughan, Acton, W.*

Robert Stephenson's Tubular Bridge across the Menai Straits.

FAMOUS BRIDGES OF THE NINETEENTH CENTURY.

design the Britannia tubular bridge over the Menai Straits upon that ugly though sound principle, though in justice it must be admitted that his original suggestion for a cantilever bridge was not accepted.

The tubular bridge was the first attempt to use wrought-iron exclusively for long spans. Stephenson and Harrison had finished in 1849 the high-level bridge at Newcastle-upon-Tyne, with its masonry piers, cast-iron arched ribs, and wrought-iron ties—a bridge that remains as the link between the old cast-iron and the modern wrought-iron types. The smaller wrought-iron tubular bridge over the Conway river, of 400 feet span, was successfully opened for traffic in 1848, and the larger bridge was in course of erection. There are two central spans of 460 feet, and two side spans of 230 feet, at a height of 100 feet above high water. There are two separate wrought-iron tubes side by side, each 1,510 feet long, resting on three towers of masonry and the end abutments, so as to give the required spans. The tubes are rectangular in section; the top and bottom booms are cellular; the whole is built up of wrought-iron plates riveted together, supported solidly on the central tower, and on rollers on the side-towers and abutments. The design was closely copied in the Victoria bridge over the St. Lawrence at Montreal, finished in 1859.

The webbing connecting the top and bottom flanges of a girder need not be plain plate-iron, as in the 1850 Torksey bridge in Lincolnshire. It may well be made in lattice form, and, in fact, the open-work type was tried by Sir John MacNeill, as long ago as 1843, over a short 84-feet span near Dublin. The type is now very general, by reason equally of its strength, neatness, and simplicity of construction. A good example is given by the Charing Cross railway bridge in London. The completion of the Forth Bridge in 1889 marked a great advance in the history of girder bridges, as it introduced cantilevers for long spans, and was immediately copied for bridges in various parts of the globe. Imagine two enormous steel brackets back to back, forming together a beam or lattice girder 1,700 feet long, tapering each way from the middle, where the whole is supported on a substantial pier. Such is the double cantilever. Its two parts, built up simultaneously, balance each other. Another similar cantilever is at

a distance of 1,700 feet, and the short space between their near ends is bridged by ordinary lattice girders, also built outwards from each end. The Forth Bridge is designed with a taper in plan—that is, it is widest at the piers, narrowest at the centre of each large span. This is mainly to withstand lateral wind pressure safely, a lesson learnt from the

THE FORTH BRIDGE.

sad catastrophe to the original Tay Bridge, overthrown by a storm in December, 1879 (p. 877).

The operations of building the piers in deep water were unique at the time, and offer the best example of the direction of development of this part of the subject. Hollow wrought-iron caissons, or water-tight cylinders, 70 feet in diameter, were sunk to the rock-bed 72 feet below the water-level. The rock was cut away to receive each caisson, by operations carried on in a chamber at its base, supplied with compressed air at 33 lbs. per square inch to resist the encroachment of the water. Where the bed was of mud, the weight of the caisson carried through to the stiff boulder-clay below. In each case the caisson and mining-chamber were filled with concrete, so that, when set, each caisson constituted a firm stone pillar 70 feet in diameter.

The main improvement in suspension bridges has been in the process of stiffening by some form of lattice-work. The suspension principle may well be combined with others, as with the Tower Bridge, where the side spans are half suspension, and the centre span has two permanent lattice-girders and the lower drawbridge. The Telford bridge over the Menai Straits still remains our finest example of the simple type. It was

*Photo: C. Vaughan, Acton, W.*

THE VYRNWY DAM.

opened in 1825; it has a span of 579 feet, and the roadway is 100 feet above the water-level.

**Canals and Water Supply.**

The growth of railways has been attended with a decline in canal traffic in this country. Yet it is very possible that this generation will see the advantage of rescuing our extensive waterways from desuetude. The only great canal scheme of this century has been that of the Ship Canal connecting Manchester with the Mersey estuary. It is 35 miles in length, 26 feet deep, and with a bottom width of 120 feet. There are four reaches, separated by sets of three locks. Steamers can effect the whole distance in eight hours, including all delays at the locks.

In the matter of water-supply, the growing interest in problems of public health, and the municipalisation of water-supply, has caused attention to be paid to the purity and sufficiency of the water for large towns, and important alterations have been proposed for Liverpool, Manchester, Birmingham, and London. The Liverpool supply from the River Vyrnwy, in Montgomeryshire, is now an accomplished fact. Manchester now derives its water from Thirlmere, in the Lake district. Birmingham is to have its water from South Wales, and London still (in 1904) supplements its former supplies by storing Thames water and drawing from wells in Kent and Herts. From the 'thirties the Metropolitan supply was in the hands of eight different companies till they were replaced in 1904 by a Water Board. A scheme has long been advocated for an aqueduct from Mid-Wales.

The chief engineering difficulties are associated with the formation of the storage reservoir near the source of supply, though the choice of route and construction of easy gradients for the conduit are matters

*Photo: Priestley & Sons, Egremont.*

THE MANCHESTER SHIP CANAL AT EASTHAM.

of importance. The main interest in the Liverpool supply scheme attaches to the masonry dam built across the Vyrnwy valley, on a bed of solid rock, forming a basin for the upland waters to accumulate. The lake thus formed is five miles long, and averages three-quarters of a mile in width. The dam is 1,200 feet long, rising 100 feet above the ground, with 60 feet of foundation below. Along the top is a carriage-road, supported on 33 arches, which give the structure a fine appearance. The aqueduct to Liverpool is 67 miles long, whereas that leading from Thirlmere to Manchester is 96 miles long.

H. C. JENKINS. Metallurgy and Mining, 1846-1885.

THE British trade in pig iron continuously, sometimes rapidly, increased, and several new districts have assumed a position of great importance. Chief amongst them is that of Cleveland, with which Sir Lowthian Bell has long been identified, and where his important work in connection with the theory of iron smelting has been done. The maximum output was in 1883 (8,490,000 tons), but since then the American demand has been met locally and our own output diminished in consequence. The annual output per furnace had increased from the 1,500 tons in the early part of the century to from 20,000 to 25,000 tons, a result due to the increased size of the furnaces and improved appliances used with them. Competition has become much more severe in later years, and the phenomenal fortunes made in early days have ceased to be easily obtained by new comers into the field. Much of the growth of the pig iron industry has been for the purpose of supplying raw material for the production of finished wrought iron and steel. In 1815, steel for the purpose of making tools and cutlery could be obtained of the highest quality. It was, and for these purposes still is, produced by the process of cementation from wrought iron, and it was costly in the extreme. But of cheap steel, or steel suitable for constructive purposes, there was none. The wrought or malleable iron was produced by Cort's process of puddling (Vol. V., p. 632), with the improvements made by Hall, but the rolling-mill with grooved rolls introduced by Cort had made it an easy matter to supply bars of any desired section. It was thus possible to produce the wrought iron rails necessary for the early railways, a requirement that of itself led to a rapid

Iron and Steel.

increase in the number of puddling mills. How great that requirement may be, will be realised when it is remembered that a mile of double railway track, even of the light character used in early days, required 100 tons of rails, and these, when of wrought iron, have to be renewed every few years. About the year 1850 the activity in the industry was astonishing. In the great centres, such as the one on the Staffordshire coal-field, the traveller by night seemed to be passing through a pandemonium on earth. He saw the huge flaming blast furnaces, and hundreds of puddling ones, the glowing of the heated masses of metal as they were being moved from place to place in the darkness, with weird human figures seen dimly in outline near them; and although this picture was, on account of better modes of working, soon only a matter of history, the production of puddled bars was not seriously checked until as late as 1882.

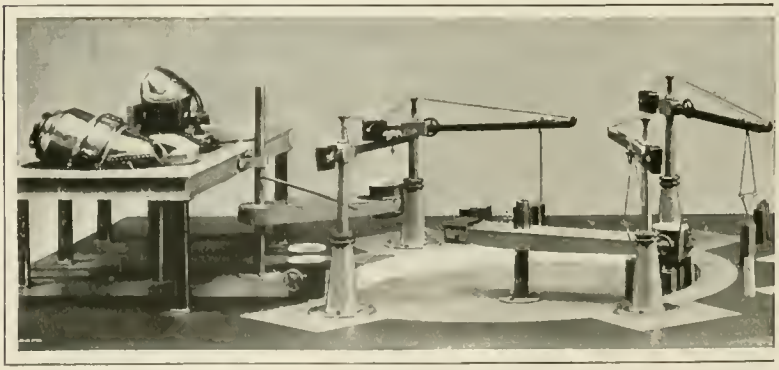
The Bessemer Process.

But in 1856 an invention was made by Sir Henry Bessemer that has had a most important and lasting effect upon the finished iron and steel industries. He was requiring a material for ordnance purposes, resembling steel in its character, but not so costly; and he endeavoured to obtain it by blowing air into molten cast iron in order to oxidise the excess of carbon. Somewhat to his surprise, he found that the temperature rose so much that it was not only needless to employ an external source of heat in order to keep the purified metal fluid, but the latter was so hot that it could be poured into ingots. The process took some little time to perfect, but after that was done, the new steel soon became an article of commerce, over 160,000 tons being made in 1869, for it could be made of many grades of carbonisation at will, and at a fraction of the cost of the "cemented" steel. The cost, moreover, was rapidly lessened, and by 1874 it was possible to obtain Bessemer steel rails at a lower price than that charged for wrought-iron ones. The latter were, therefore, displaced as fast as they were worn out, steel rails being from five to ten times more durable. Indeed, the heavy traffic of modern trunk lines could scarcely be carried on with the old rails. In 1881 the production of Bessemer steel amounted to 1,440,000 tons in Great Britain as compared with 2,680,000 tons of puddled iron produced in that year; but since then the puddled iron trade has undergone a steady decline.

Other persons had, however, been working in the same

**The Siemens Process.**

direction as Sir H. Bessemer at the time he made his invention, though they adopted different means. Sir William Siemens and his brother Frederick had been experimenting since 1846 with a view to economise fuel in manufactures, which was then being wasted in a most alarming way. These experimenters perfected the methods, now very generally adopted, by which fuel is converted, as far as possible, into the gaseous form before being finally burnt, for it was only by so doing that it was found possible to bring about perfect combustion. They were also the first successfully to introduce a method—indicated by Stirling in 1815—by which heat could be accumulated in a furnace by the so-called regenerative chambers, and they applied the method in the first place to the furnaces used in the manufacture of glass. The application to furnaces used in the metallurgy of iron was, on account of difficulties and of prejudices, more tedious, but in the new furnaces they were able to melt the finished product, which was, in all other respects, the same as that from the puddling furnace, and obtain, as in the case of Bessemer's steel, a homogeneous ingot which could be subsequently rolled. The process was brought into practical use during the years 1861–67, and at one time was viewed as a rival to Bessemer's, but by 1875 the two processes had taken their proper places in the industry—Bessemer's as unrivalled for the manufacture of the medium and harder varieties of steel, such as for rails, and Siemens's, or the open-hearth process, as



BESSEMER

*(By permission, from the Model lent by Messrs. Ojers,*

being the more suitable one to use for the production of ductile varieties, such as boiler plating, some of which is nearly pure iron. In the year 1882, open-hearth ingots to the extent of 400,000 tons were made, whilst in recent years this variety has, with Bessemer steel and with puddled iron, been made in about equal amounts for each.

**The Gilchrist Process.**

During the period of 1874–79 three metallurgists of the London Royal School of Mines, named Snelus, Thomas, and Gilchrist, developed a modification of these processes, by which phosphoric ores could not only be used in making the best steel, but the phosphorus could be incidentally extracted and returned to the land as a valuable manurial agent. This improvement, whilst it enabled the metallurgists of this country to use ores hitherto useless for the purpose of steel-making, has enabled our Continental rivals to do likewise, and has probably been of far greater value to them than to us.

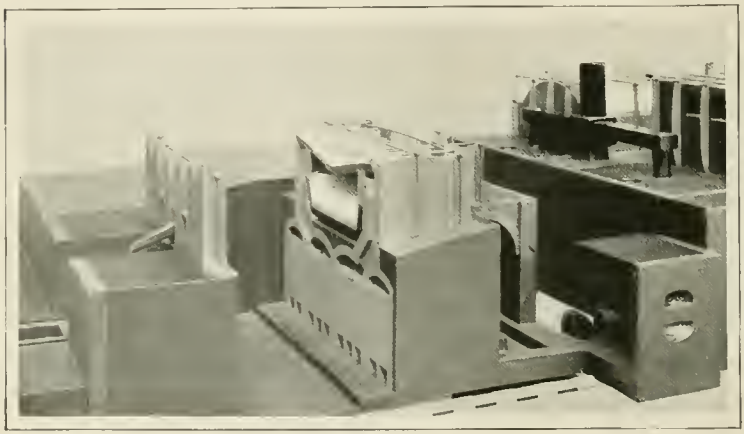
**Ship-building.**

Iron and steel shipbuilding is rather one of the other branches of engineering itself than belonging to metallurgy and mining, but mention is necessary on account of its intimate connection, and also on account of the enormous relative interest this nation possesses in it, and the large amount of employment given to skilled labour by its means. The development of ocean steam traffic—though sailing-ships long maintained their position of supremacy as freight carriers (p. 464)—had of course a considerable effect eventually on the demand for coal. It was in

STEEL WORKS.

*Mills & Co., to the Victoria and Albert Museum.)*

1850 that the industry began to assume importance, when 12,000 tons of iron shipping were built. Iron is so much better as a structural material than wood that its use extended from year to year, some ships being built wholly of iron, others with iron framework and wooden planking, but these latter diminished in number as improvements in the manufacture of iron plates were made. In 1883 the annual production of iron shipping in this country had increased to 732,000 tons (by measurement), and the use of wood had been for some years almost entirely



SIEMENS'S "DIRECT PRODUCTION" STEEL APPARATUS.
(*Victoria and Albert Museum.*)

abandoned for the structural part of British-built ships. In the course of the year 1888 only 54,000 tons were built of iron, a result due partly to bad trade, but chiefly to the extended use of mild or open-hearth steel, the use of which had commenced in 1879. In the subsequent recovery of trade, mild steel has been employed, to the practical exclusion of all other material; wood is, indeed, reserved almost entirely for the purpose of the interior fittings, or as the material for small boats. On account of the use of the new material—mild steel—great improvements have been made both in the forms of ships and in their machinery, and it is now possible to carry goods at very low rates; so that by fitting ships with refrigerating chambers and means for producing artificial cold, even perishable goods can be cheaply brought to this country from the Antipodes. The general

economic consequences of this must be dealt with elsewhere (pp. 806–814), but it may here be noted that many ores that were formerly brought to our centres to be smelted can now be more cheaply treated at the mines from whence they are obtained, with coke brought from some other neighbouring country. Again, ores that are of slightly better quality than our own can profitably be imported and smelted instead of it, *e.g.* the Bilbao hematite.

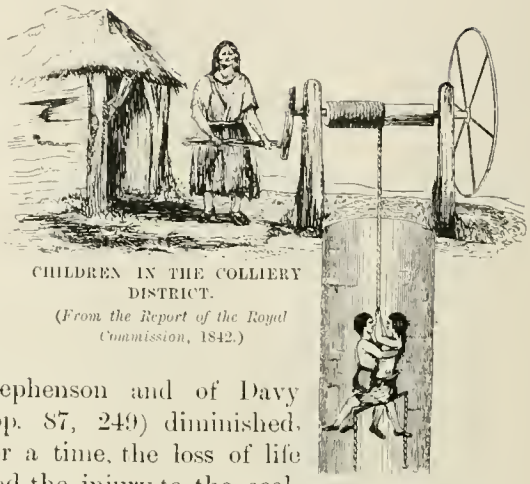
THE *THERMOPYLÆ*.
(*From a print supplied by Messrs. G. Thompson & Co.*)

**Coal Mining. The Output.**

At the beginning of the century about 15½ million tons of coal were raised annually, but the output increased very rapidly. It was 64½ million tons in 1854, when the number of work-people employed was about 200,000. It is only since this date that accurate and continuous records have been kept. In 1885 it was 159 millions of tons, a quantity more easily realised by comparison to a cylinder a mile in diameter and 230 feet high; and in that year the industry gave occupation to 478,000 men and boys. Most of this coal is used in this country, about one-eighth of the total being exported. The conditions of the persons employed in coal-mining has been subject to much change. For very many years there was practically no legislation by which to control the conditions under which work was

carried on, and the cheapest way to a given end tended to be the one adopted. Indeed, as regards some Scotch miners, actual and legal slavery existed to as late a date as 1799. The introduction of the safety lamps of Stephenson and of Davy (pp. 87, 249) diminished, for a time, the loss of life and the injury to the coal-pits from gas explosions, but other accidents were frequent and of appalling fatality, the workmen themselves, as well as their leaders, being too ignorant to render improvement either in their practice or condition of life an easy matter. The employment of children of tender years, as well as of women, underground, although giving occupation to cheap forms of labour, tended greatly to aggravate this evil.

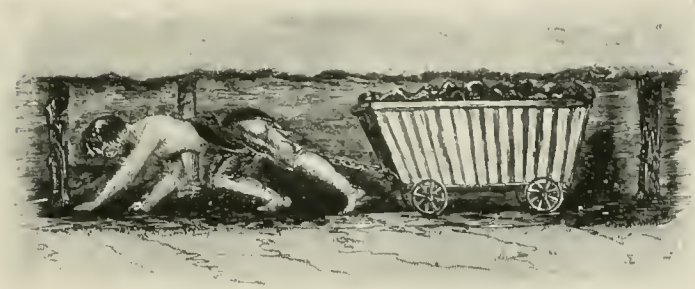
First Coal Mines Act, 1842.



CHILDREN IN THE COLLIERY DISTRICT.
(*From the Report of the Royal Commission*, 1842.)

WOMEN CARRYING COAL.
(*From the Report of the Royal Commission*, 1842.)

Some revelations as to the terrible state of things that existed in many parts of the country led, in 1842, to the introduction of a Bill in the House of Commons by Lord Ashley (p. 314). It prohibited the employment underground of girls or women altogether, and of boys till the age of ten. Such employment, from the age of seven, appears to have been one regular way by which the Guardians of the Poor provided for their pauper charges. The Act, moreover, limited apprenticeship to a period not exceeding eight years; it prohibited the payment of wages in public-houses, and



WOMEN AND CHILDREN IN THE COAL MINES.
*(From the Report of the Royal Commission, 1842.)*

empowered the Secretary of State to appoint inspectors. One such inspector was appointed; his duties, however, did not at all correspond with those of the inspectors to whom reference will subsequently be made. The Bill did not touch the question of education, although it was quite common for those superintending the miners underground to be themselves unable either to read or to write.

The view was generally held at this time, and, indeed, seems to have been accepted even by Lord Ashley, that underground inspection of the mines would be resented by the miners. But within a few years of this date large petitions were presented to Parliament from the men themselves, asking for means of education, for efficient inspection of the mines by competent Government inspectors who understood the art of mining, that efficient ventilation should be compulsory, and that permanent and accurate plans of all mines be kept for future reference.

Act of 1850. These conditions were finally embodied in the Coal Mines Inspection Act of 1850. It introduced the principle of State supervision of the work itself in order to prevent accident, the entire responsibility, however, of the proper conduct of operations resting with the proprietors and mine managers. Notice had to be given of all fatal accidents, and the first trustworthy record of these is for the year 1851, when 984 persons lost their lives in coal mines in the United Kingdom. It was soon seen that not one-half of these deaths were due to the explosions of gas, and though such accidents come more prominently before the public, yet the greater part of the loss of life is to the present day by ones and twos at a time from falls of the roof, defective plant, and similar causes. Difficulty was found in obtaining the highly-trained men suitable for inspectors, and no institution existed in the country at which students could get the requisite training in the mining profession, until, by the efforts of Sir H. de la Beche (p. 84), and under the patronage of the Prince Consort, the Royal School of Mines, London,[1] was founded in 1851. Six suitable inspectors were, however, found

Act of 1855. and appointed; this number was increased to twelve in 1855, when a further Act was passed enforcing the adoption of special rules adapted to the requirements of different collieries.

[1] This, the earliest technical institution in the country (p. 86), has since been incorporated with the Royal College of Science.

Breaches of these Acts were penal, and the proprietors could be fined and workmen imprisoned for committing them. Evasions, for some time far from rare, were less in number after the Cymmer explosion in 1856, when 114 persons lost their lives, and the responsible officials of the mine—namely, the manager, overman, and fireman—were indicted for manslaughter in consequence. Technical grounds prevented an actual conviction, but the deterrent effect remained. In 1860 a further Act raised the minimum age of engine-men from fifteen to eighteen years, very much increased the powers of the inspectorate, ordered that coal should be truly weighed, and secured that boys should have some education. It also compelled the use of boreholes in advance of new work, whenever old workings were being approached; for these latter are generally full of water very liable to break through without warning. The importance of this precaution, as well as that of keeping accurate plans of all old workings in some easily accessible place, was emphasised in an appalling way in the following year at the Clay Cross Colliery, where some old workings were unexpectedly pierced and twenty-three men and boys lost their lives in the irruption of water that followed. Subsequent investigation showed that at the spot where the irruption occurred, the old workings extended forty-two yards beyond the line at which they were supposed to end.

Act of 1860.

The importance of duplicate and independent exits for each mine had for years been recognised by experts, but the provision had never been made compulsory. In January, 1862, however, an accident occurred to the pumps in the Hartley Colliery, a pit only provided with one shaft, divided, for the purposes of working, into two parts by a partition. The accident led to the immediate fracture of the large overhanging cast-iron beam of the pumping-engine, and the broken half fell down the shaft, killing the men in the cage and choking the shaft with *debris*. By untiring effort, and in circumstances of great personal danger to the relief parties, a passage was made down to the upper workings of the mine in the space of six days, when it was found that everyone in the pit had perished by foul air, after escaping from the water that accumulated in the lower of the two seams which were worked in the mine. These two seams had not long before been connected by a ladder placed in a

The Hartley Accident.

Act of 1862. short ventilating-shaft, that did not, unfortunately, extend to the surface, and the connection had been made at the suggestion of the Government inspector as a second means of escape from the lower seam in case that were flooded, of which there seemed to be some danger. No less than 204 lives were lost, but in June of the same year a short Act was passed compelling all coal-pits employing more than twenty men to have two shafts extending to the surface, and not less than ten feet apart.

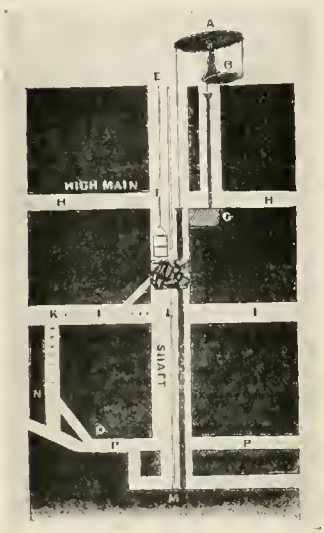



DIAGRAM OF HARTLEY COLLIERY, 1862.

*(By permission of the proprietors of the "Illustrated London News.")*

The next important Act, that of 1872, required all collieries to be in personal charge of competent and certificated managers. More rules for general work were inserted, so that safety-lamps had to be locked wherever their employment was necessary for safety: a daily examination for inflammable gas had to be made with the safety-lamp in all mines before the men commenced to work; and in most cases the lamp used by the fireman for testing had to be locked. These stringent provisions were to protect the men against their own wilful carelessness. The Act rendered it penal for any but authorised persons to open safety-lamps underground, and only then under certain well-defined conditions. Blasting of the coal was permitted only under very stringent regulations. It has always been recognised as a source of danger, and many attempts were made to substitute steel wedges, hydraulic presses, and even the expansion of quicklime cartridges when slaked, but the use of explosives has still been found to be necessary in many mines. The Act of 1872 gave to the miners the privilege of maintaining at their own expense a man at the surface to watch the weighing of the coal on their behalf, their work, if by contract, having to be paid for by weight,

Coal Mines Act, 1872.

and it gave them the further right to appoint some of their own number to make a complete inspection of their mine at their own cost—a useful privilege, but one very rarely exercised. Certain breaches of this Act rendered the owners and managers as well as their men liable to imprisonment. In 1887 a new Act recognised a higher grade of managers; so that certificates are now granted in two classes, first and second, the former being for the more responsible leaders, who require high qualifications. Boys were not allowed to be employed under the age of twelve, nor engine-men under the age of twenty-one—a condition that was sought to be inserted in the first Coal Mine Acts; and it was further enacted that the latter, when engaged in hoisting men, should not on any account be interfered with, and should, indeed, be authorised to require any other person to leave the engine-room.[1] The powers of the inspectors and of the Secretary of State were enlarged, and the latter could sanction the payment of a fine to parties injured in an accident, or to their relatives if the accident were fatal. Magistrates could inflict penalties up to three months' imprisonment with hard labour for some breaches of this Act.[2] As the result of such careful and progressive legislation, the annual death-rate from accidents in mines in the United Kingdom has been gradually reduced from 4·5 per 1,000 to 1·5 per 1,000; and although, as will have been seen, inspectors have large powers, and managers many rigid requirements to keep, yet the industry has not been economically prejudiced on that account.

**Explosions.**

It was for many years an enigma that disastrous explosions were continually occurring, notwithstanding all the care given to mining problems by trained and scientific men, and the stringent regulations laid down by Act of Parliament. Some of these were traced to sudden liberation of large volumes of gas from the 'goafs," or exhausted parts of the mine, usually occurring at periods when the barometer was abnormally low; others were traced to deficient ventilation, and to culpable behaviour of

[1] Prior to 1850 winding had often been entrusted to boys, and shaft accidents were common in consequence.

[2] The age of employment for boys underground was raised from 12 to 13 in 1900. Otherwise there has been no new legislation since this section was written in 1897.]

someone in the pit, as, for instance, the opening of a safety-lamp; but in many instances the explosions were in well-conducted mines, and no adequate cause for a long time could be found. Thus in 1866 an explosion occurred at the Oaks Colliery, and 361 persons lost their lives; another occurred at Blantyre in 1877, and 207 were killed; whilst in 1878 as many as 268 were killed in an explosion at Abercarn. It was ultimately surmised that the Oaks explosion was due to the sound-wave from blasting, that reached a safety-lamp in an explosive atmosphere with sufficient violence to momentarily drive the flame through the protecting gauze and thus to fire the mine. Experiments showed this to be possible, whilst survivors from the explosion remembered hearing the sound of a blast immediately before the accident. The Acts of Parliament of 1872 and 1887 have therefore contained special conditions in order to provide against the recurrence of explosions from such a cause.

There yet remained the problem why some explosions appeared to extend over all the mine in which they occurred, and were accompanied by great violence, and by brilliant flames from the shafts as from the mouths of cannon, since ordinary fire-damp burns slowly; indeed, in olden days the "fireman" intentionally fired the gas to get rid of it in small quantity, dangerous though the practice might be. The hypothesis at length gained ground that these cases mainly owed their violence to the fine coal-dust suspended in dry air that might otherwise be scarcely explosive at all. Notable amongst the investigators who submitted the matter to experiment was Mr. Galloway, one of the Government inspectors for coal mines, who, during the period 1875–80 secured the co-operation of mine-owners, so as to be able to experiment with the actual dusty gases of the mines themselves. His experiments, communicated to the Royal Society of London, show the hypothesis to be true beyond doubt. The obvious remedy was to water all dusty mines. The Act of 1887 did not render this obligatory, yet it has been practised with most satisfactory results. The necessity for good safety-lamps is undiminished, but should explosions of gas occur they remain comparatively local in character, and do not involve the whole mine unless it be full of fire-damp, which is rarely the case. One accident that occurred in 1877 at the Troedyrhiw Colliery attracted much

public attention and sympathy, and is mentioned as illustrating a class of accident common to all mining operations, namely, that due to irruption of water. The subsequent rescue, however, could scarcely have been effected in any but a coal mine. Fortunately, only fourteen men were in the pit at the time of the irruption, and the workings were not completely filled with water. Exploring parties in the dry portions of the pit heard signals through the solid coal, and cut their way down towards their comrades, whose position was, of course, known. Four men were rescued during the next day, but it occupied ten days to reach five others who were shut off, by the water, in the top end of an inclined heading, the whole of which was much below the water-level. By the exercise of much skill, the men were rescued by means of the tunnel made by their rescuers, and they recovered, although for eleven days they had been entirely without food. The remaining five men were killed by the accident. Troedyrhiw Rescue, 1877.

The mode of working the coal mines has varied during the century rather in detail than in principle. The older method was, after reaching the strata to be removed, to take out as much of the material in "stalls" as was thought to be safe, leaving sufficient "pillar" to support the roof of the workings, and only a portion of the material was thus available. There are still many kinds of "pillar and "stall" work, differing only in detail, but the introduction of the safety-lamp (p. 87), first used at the Hetton Colliery in 1816, rendered it practicable to work in what were very dangerous circumstances as regards fire-damp, and to remove the "pillars" also. The practice was soon followed by leaving more and more of the coal in the form of pillars, and thus a transition took place to what is known as "long-wall" working, where roadways only are first formed, and almost the whole of the coal subsequently removed, leaving the superincumbent strata to sink down on the top of the "wastes" left behind by the workers. Some form of long-wall working is now usually adopted wherever practicable. Improvements in Mining.

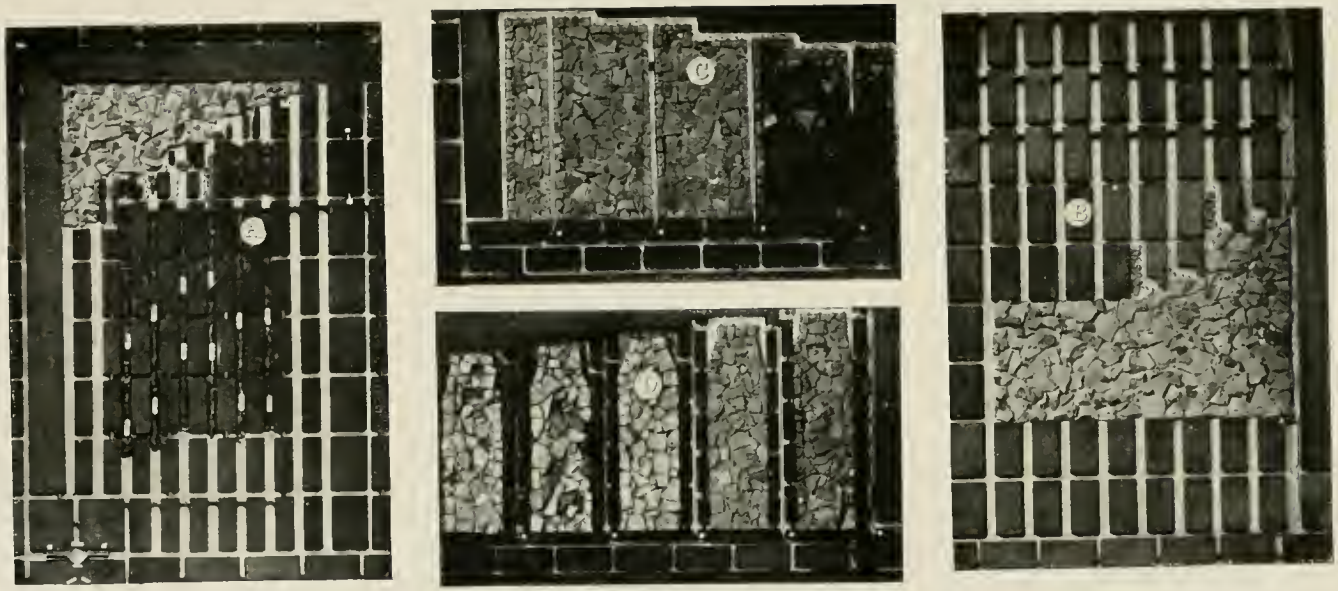
The ventilation of mines has long attracted the attention both of engineers and of the Legislature. About the year 1820, it became the practice to divide the mines, some of which were already large, into distinct portions or "panels," each of which was complete in itself as regards its roadways and ventilation, in Ventilation.

order to ensure that the air from the downcast shaft should not have too long or tortuous a path to travel to the upcast one. The "panels" were frequently divided from one another by a wide band of unworked coal. When the earlier Coal Mine Acts were discussed, it was sought by some to make the use of rather small "panels" compulsory, but the matter was finally left to the judgment of owners and managers. Indeed, there is some difficulty in framing so sweeping an enactment, owing to the widely differing condition of mines even when near one another. Moreover, it was found that the "panels" did not give immunity from explosion involving the whole mine, the danger of the coal-dust itself not being at that time fully understood. For very many years the ventilation was always secured by the use of a large furnace placed at the foot of the upcast shaft but fed by a little fresh air, whilst the foul air was admitted at some distance higher up. This method was so efficient as to necessitate the use of better forms of safety-lamps—such as that of Mueseler—to withstand the faster currents of air that were produced in the workings, and for many years the method was supposed to be without a rival, although jets of steam or of compressed air were occasionally used under special circumstances. But about the year 1849, a Mr Powell had a large centrifugal fan, designed by Brunton, in successful use at the Gelligaer Colliery near Newport. It had a vertical axis and was placed at the surface on the ground. The use of the fan made its way only slowly. It was used in South Wales, and finally in Durham in 1860. But it received a great impetus after the year 1862, when Guibal exhibited another large fan at the London Exhibition. The many advantages accruing from the use of mechanical means at the surface were then more fully recognised, and fans running at various speeds according to their size have since become the usual means of ventilation for coal mines.

Pumping.

The pumping-engine is an invention that belongs to the eighteenth century (Vol. V., pp. 424, 427). It has rendered possible the mining operations of the present time. Many improvements have since been made, with a view to pump the water more economically or conveniently, but these are rather in details that belong more strictly to technical treatises.

The haulage of the coal from the place where it is obtained



MODEL SHOWING FOUR METHODS OF GETTING COAL.
(*Victoria and Albert Museum.*)

Mechanical Haulage.

to the foot of the mine-shaft has, on the other hand, been greatly improved in important particulars. The use of cast-iron tramways in collieries appears to date from 1767, when they were put in the one at Coalbrookdale. The material was adopted on account of its temporary cheapness, but it was soon seen that the outlay was insignificant when compared with the advantages to be gained by its use, which rapidly spread. About 1820 George Stephenson introduced mechanical haulage underground, but not generally, and its ultimate success was only due to the use of steel wire ropes, which belong to a later period: but it should be noted that the coal mines of the Newcastle district were for many years in a much better developed condition than existed elsewhere. The Act of 1842, and the consequent withdrawal of women from the coal-pits, where they had been employed literally as beasts of burden, compelled the proprietors of the Scotch and Welsh mines to use ponies and horses underground: this they soon found to be highly advantageous from the economical as well as from the social point of view. It must be remembered, however, that much hauling has still, and probably always will have to be, done by men and boys.

For many years mechanical hauling and winding had to be performed either by the aid of chains or by hempen ropes. The use, however, of the former means was found to be attended by so much danger, owing to the progressive damage done to the iron itself by the continual vibration inseparable from the passage of chains over wheels, that it had to be abandoned. Flat hempen ropes, many of them of great size, were used for winding until about the year 1862, when Newall carried the

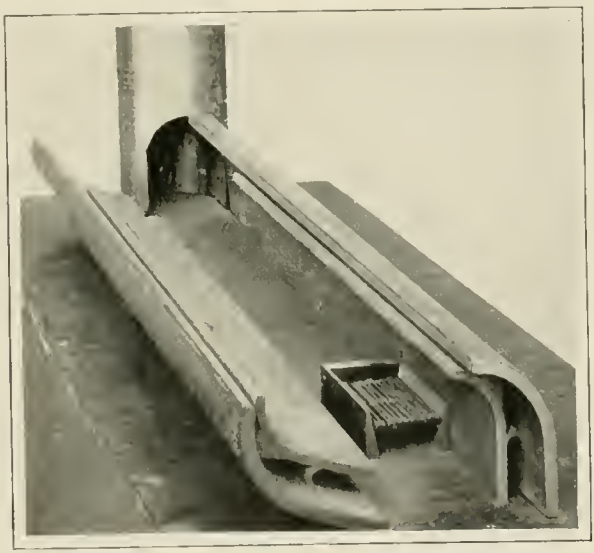
Wire Rope.

manufacture of metallic wire ropes to such a degree of perfection as to justify their substitution in the place of hempen ones: at the present day steel wire ropes are exclusively used, and with their advent mechanical means of haulage underground became both possible and general. The rope is sometimes driven by an engine at the surface, as Stephenson suggested, at others by engines placed underground and driven

Winding.

by steam or compressed air. The speed of hoisting or winding, as it is termed, has, during the latter half of the period of this volume, become uniformly very high, and in this particular the Newcastle district was long in advance of the others. At many

pits the load is lifted from the depth of half a mile in the space of a minute, and, if the mine be not so deep, at correspondingly rapid rates. This compares very favourably indeed with the speed of fast railway trains on short journeys; but owing to greatly improved appliances, and the efficient state in which they are maintained by close inspection, as well as the high sense of duty of the present class of responsible engine-men, shaft-accidents are, unlike the case in earlier years,



MODEL OF A SOUTH WALES COLLIERY VENTILATING FURNACE, WITH LEFT WALL THROWN BACK.

*(Victoria and Albert Museum.)*

very rare. In the best collieries, self-acting appliances are provided in case of need, as, for instance, the self-detaching hooks that liberate the cage from the rope, and prevent it from falling down the shaft again in cases of overwinding. These hooks, the independent inventions of Ormerod and of King, have, since their introduction in 1865, been the means of saving many lives.

The great and increasing activity in the coal and iron trades brought forward the question of the duration of our coal supply. A Royal Commission, appointed in 1866, after

Our Coal Supply.

collecting much evidence and carefully investigating the whole of our resources as then known, presented its report in 1871, showing that with the existing rate of consumption, and the population stationary, there was a visible supply of coal for 1,273 years, but that on the supposition that the rate of consumption and the population both increased at the rate observed in the past, there would only be a supply for 276 years.[1] Although more pessimistic views have not been wanting, yet for many years these figures have been generally accepted as approximating very closely to the truth. More recently, however, some discoveries of coal at Dover have led to the hope that there are still considerable deposits in this country within reach, but as yet untouched.

It is important to notice that there has been a tendency in quite recent years for the annual output from each miner to decrease, notwithstanding the improvement in machinery and appliances that is always going on. The decrease in useful output per head has been accompanied by a corresponding increase in cost per ton—a result due, apart from any difference in the rate of wages, to the fact that many of the more easily worked seams are becoming exhausted, and in some degree to the cost of the means taken for increased protection of life and limb, as well as to the decreased number of hours worked during the year by the miners owing to united trade action.

The Workers.

The workers in other industries have been somewhat differently placed from the miners, whose work is still largely done by manual labour. The uniform tendency has been to greatly increase the annual amount of work done per head, owing to the introduction of labour-saving appliances, and to thus cheapen the product. But in nearly every branch of trade this has not led to any ultimate decrease in the number of workers, but rather to so great an increase in the industry by the greater consumption of the cheaper and often more convenient product, that the number of employees has increased. This can be seen in the pig iron industry, where much of the severe work is done by purely mechanical means, as well as in the iron and steel manufacture, where even the handling of the material is performed by machinery; and operations such

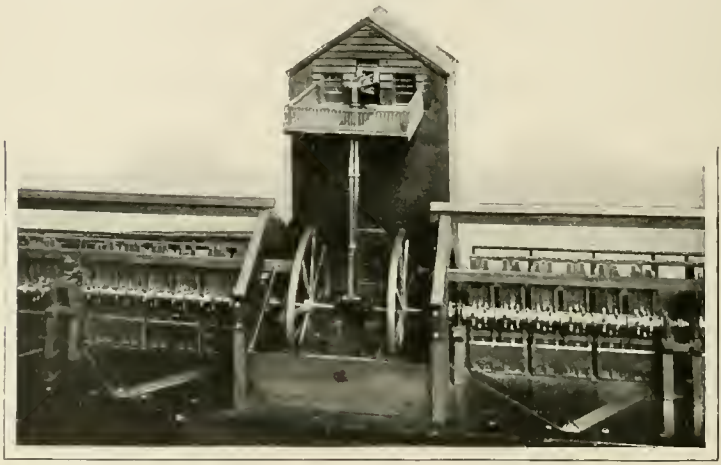
[1 Another Royal Commission to inquire into the subject was appointed at the end of 1901.]

as the production of "Bessemer" or "open hearth" steel have, to a very great extent, replaced the brutal manual one of puddling. The workers, having rather to direct operations than to labour at them, tend thereby to produce a finer or more uniform product; at the same time the management both of mining and of metallurgical concerns has passed into fewer and fewer hands, on account of the enormous amount of capital necessary for so complete an organisation as is required under the new conditions. Individual enterprise has therefore merged into corporate, and much of such sympathy as formerly existed between master and workman disappeared in the change.

**Minor Metallurgical Industries.**

What has been true in this respect of the iron industries has, though to a less degree, been true of those of the metallurgy, of lead, of copper, of tin, and of zinc. Small industrial concerns have mostly disappeared, being absorbed into larger ones at a few centres, but where they have survived it has been, as in the case of iron works, to share in increased trade until the diminished imports of ores (p. 749) adversely affected them. But British mining industries, other than those connected with the coal and iron trades, have generally declined during recent years. Lead, for instance, has greatly declined as regards the amount of output, which was about 79,000 tons in 1848, and only 59,300 tons in 1882. The British tin industry has occupied an almost stationary position throughout the whole of the period under review, although the production of enormous quantities of tin-plate, an industry giving much employment to labour, has been met by imports of foreign and colonial tin. The British tin deposits have been worked for two thousand years, and are at many places at such depths that the output is only maintained with great difficulty at the low prices obtained for the metal during recent years, and this with very low rates of wages. The annual supply of British copper, another of the metals worked here in Roman times, increased from 1815, when it was 6,800 tons, to the year 1856, when it was 13,200 tons, after which it has declined to 2,700 tons in 1885. This has been accompanied by an almost continuous decrease in the average richness of the ores, a sure sign of exhaustion of the deposits. Our increased demands for these metals have been, it is needless to add, necessarily

supplied from foreign sources, and the prices have varied very much from time to time, the comparatively small stocks in the world rendering speculation possible on a large scale. In the case of copper the demand has varied, owing, amongst other things, to the substitution of iron and mild steel for its use for many purposes, and to its diminished requirement for the sheathing of wooden ships. It appeared, indeed, at one time



MODEL OF CORNISH TIN STAMPS.
(*Victoria and Albert Museum.*)

that copper would soon cease to be of its former importance in the industrial arts, but a new and increasing use of the metal for electrical purposes has not only removed that fear, but led to the extensive adoption of electrolytic means for refining. On the other hand, the zinc industry must be said to have become firmly established since 1823, and the metals, aluminium (discovered in 1827), manganese, nickel, and chromium, removed from the list of costly cabinet curiosities to form useful articles of commerce.

J. C. L. SPARKES. Pottery and Porcelain, 1815-1885.

THE subject is vast, as it practically covers every grade of manufacture, from a brick or a roofing-tile to the most exquisite example of eggshell porcelain. It will therefore be necessary to deal with certain large sectional divisions in the briefest possible

way. The difference in the material, decoration, and use of the modern ware from that which it has succeeded renders it needful to make a general statement in the nature of a retrospect.

The art of the potter had, in the eighteenth century, become not only very important commercially, but very interesting from the artist's point of view. But the industrial depression resulting from the French Revolution and the war with France caused the disappearance of many of the most celebrated potteries that had added charm to the households of the period, and done great credit to those who founded them and those who worked in them.

The importation of Chinese porcelain articles had already severely shaken the more homely pottery of the sixteenth and seventeenth centuries from its hold on the affections of the housekeeper, inasmuch as that and all similar ware—*e.g.* that of Delft—was made of an inferior body, which was porous and of a dark colour, and its artistic beauty—for it was covered with an opaque enamel, on which the lavish decorations of Gubbio, Faenza, or the Delft artists were painted—could not protect it against the claims of the more perfect and cleanly porcelain of China. Nevertheless, until the discovery of the China clay, or Kaolin, the imported ware was too expensive to interfere materially with the demand for ordinary pottery. When, however, that discovery was made and applied practically at Meissen, it had stimulated all the potters of England to making similar ware, until the same process was independently discovered by Cookworthy and patented by him in 1768 (Vol. V., p. 428). Then the more beautiful and painter-like ware of the Majolica artists languished until it disappeared altogether. Delft, a ware named from the place of its first origination, continued to be made in Lambeth as late as 1840, though no longer in the form of dinner and domestic ware, but in that of articles of commercial use.

**Kaolin.**

The aim of the potter was first to imitate the porcelain of China, and this had already been done by Cookworthy; but the difficulty attending the manufacture of china, as it was called, led the makers to produce a cheaper ware than porcelain, which ended in the manufacture of earthenware, the name for the ordinary dinner and tea services, and the innumerable other forms to which the material is applied. In this ware it is believed

**China and Earthenware.**

that the English clay, tempered, wrought, and worked by the English potters, is the best of its kind in Europe. In mere quality of material it stands at the head of all the various French and German or Scandinavian manufactures.

Still, in outlying districts abroad—*e.g.* Brittany, Italy, and some districts in Germany—Delft is still made to supply the local demands for articles of everyday use. Much as in England, there are many potters still making the ordinary red clay pots and pans with a soft lead glaze; but these are survivals, and, except in special cases, where the old ware is absolutely more suited for its purposes than earthenware would be, it is certainly being slowly but surely ousted from the markets even of country places by the ordinary earthenware, which is cleaner, more durable, cheaper, lighter, and always purchasable. Already in the last century in Staffordshire a better ware than these lead glaze wares for domestic use had been made by a salt glaze process, but this, too, though interesting to collectors of the present day, had to give way to the cheaper and more easily produced material.

**Progress in the Trade.**

The improvements in this material, more than any new methods of manufacture, are, in the main, what the chronicler has to deal with in the period under review, since from the making of a brick to that of a porcelain cup of the finest texture, the principles involved are the same to-day as they were in all previous time. No doubt numberless improvements in machinery have brought about a greater speed of production, and consequently a greater output, but, with trifling exceptions, no new methods can be recorded as helping forward the gradual increase of the productions of this manufacture. Brick- and tile-making machinery has been improved until, probably, finality has been reached in this section of work. Potters' wheels, lathes, and jiggers are driven by steam power instead of by hand; dies are used more frequently, methods have been quickened and production doubled by these and the introduction of piecework. Great improvements have been made in general arrangements: the workpeople are better housed in better factories, where ventilation and heating are properly applied on scientific principles; the old stoves for drying the ware are now superseded by steam-pipes, which are less exhausting to the workmen. Steam also heats the printers' presses and prepares

the clay. The consumption of coal has been saved by a third by better methods of firing. With all this better lighting and more healthy surroundings it is not surprising that a corresponding improvement in taste and decoration has been possible. Nevertheless, no new principle of manufacture has been

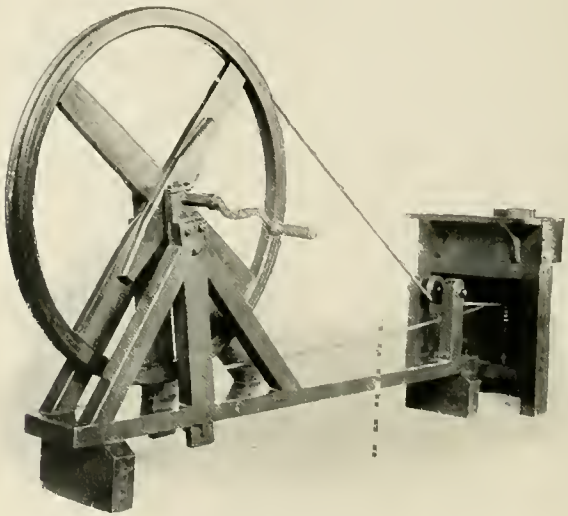
PIERCED WORCESTER WARE.

*(By permission, from "A History and Description of English Porcelain," by W. Burton, F.C.S.)*

introduced. The eighteenth century saw the discovery of china clay (Vol. V., p. 430) and the numerous establishments for the manufacture of porcelain from it. All other bodies and glazes were known, and to some extent practised, so that it is possible to say that in the time under review, probably only two new inventions, if they may be so called, have been made. One is

Parian Ware.

the use of what is called "Parian" as a material for statues and statuettes, and figures of novelties. It is a body of somewhat soft yielding texture, which shrinks very much in the kiln, and, it is feared, shrinks unevenly. This prohibits its use in the reproduction of serious sculpture, or of works of high importance, but it is very useful, and adapts itself prettily to ornamental figures where an uncertain surface and slight disproportion are



A POTTER'S WHEEL.

*(Victoria and Albert Museum, by permission of Messrs. W. Boulton.)*

no great detriment. This material enjoyed great repute through the thirty years from 1851, but is now mainly used for the building up of floral groups, which are very skilfully done, busts, and smaller objects of decoration, which do not form any very important branch of manufacture. It has been used as a material for ornamental and useful ware when fired with a metallic glaze, as at Belleek, county Fermanagh, in Ireland. It has a pleasing mother-of-pearl lustre, and its manufacture is so far a new application of an old method, first introduced by Josiah Wedgwood. Copper and platinum lustre ware is still made in certain patterns in Staffordshire, in Longton, for foreign markets, especially Spain and Mexico, and Spanish-speaking countries,

Lustre Ware.

VIEWS AT THE ROYAL PORCELAIN WORKS, WORCESTER.

but in diminishing quantities. The artistic points in this ware call for no remark; the potter supplies what the buyer demands.

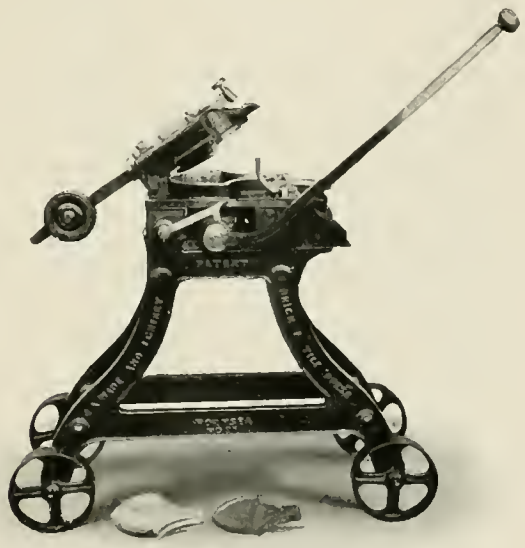
Pressing Clay. Tiles.

The other invention is based on the discovery of the power that the particles of quite dry clay possess of adhering together when subjected to strong pressure in a steel die. It is manifest that this obviates the distortion in the kiln that usually results from the evaporation of the water with which the clay is mixed, and has the further advantage that there is less shrinkage than in a clay object pressed in the usual way from clay and water. It is largely applicable to the production of tiles, lids of jars, and innumerable other objects, and was at first and for many years after its discovery applied solely to the manufacture of buttons. Still, few could have foreseen what an important branch of business would ultimately grow out of Prosser's patent, which Herbert Minton perfected and applied to so many uses. Perhaps the most original and characteristic growth is that of the tile industry, which is practically built on the use of this patent. Tiles can be made with various layers of coloured clays in powder, the result being the encaustic tiles of the modern church architect and decorator, which have had an enormous demand for every country in the world, and have taken the place of the old slip-made encaustic tile, a survival of the tiles and method of the Middle Ages.

Advances, 1801-1851.

The first twenty years of the present century can scarcely be called examples of business activity; though it was in 1805 that Spode's opaque china drove the French faience from the market. He introduced printed patterns in direct imitation of the china patterns—*e.g.* the willow pattern, which became the rage and brought the firm a fortune. Spode died in 1827, and his firm became Copelands in 1833. The firm was second only to Mintons, founded in 1791. The ware was decorated similarly to Salopian ware, but was wanting in character. In 1836, however, Herbert Minton succeeded to the business, and among other things revived the making of encaustic tiles, which consist of a moulded base containing the pattern with raised edges: into this the coloured slips are poured. This method was superseded by the discovery of the dry clay process for tiles, mentioned above. Later also this firm introduced hard bodied porcelain, dry pressed tiles, pâte sur pâte decoration, and many other processes, before the Exhibition of 1851 gave us a means of

comparing our products with those of other nations. Among the stimulants which served to improve our art work were the revival of Gothic principles by Pugin, and the revival of a truer art feeling in this country, which critics absurdly call Pre-Raphaelitism (p. 636), and wrongly strove to smother by making it ridiculous. This singular latter-day Renaissance preceded by a few years the introduction of an art element into our potteries, where it had long been absent. France and Italy had also




A TILE PRESS.
(*Victoria and Albert Museum.*)

advanced, but the traditions of Sèvres and of medieval Italy were too strong for them, and led and kept them in the wrong path. England, unlike most Continental nations, has never had a State manufacture for the development of the ceramic art, and the trade is thus left to the exertions that private enterprise can make. Hence it is that the merit of having advanced the potter's art further than it has been carried in Europe since the days of the Renaissance is due to our own countrymen. They are at this moment pre-eminent among European potters, not in the making of artistic ware only, but also in the manufacture of

The English Industry.

cheap useful crockery. Our common English earthenware undersells the produce of every country where it is allowed to gain admittance, while our decorative pottery is quite as indisputably the best in Europe. The one thing wanting with us has been invention. This has led our people to apply their technical knowledge and capacity to imitations. The Majolica and Palissy wares have been travestied rather than copied, and English potters have not even feared to attempt to imitate the quite inimitable faience of Henry II.: but our great potters have done worthier things than these, and much admirable, and even original, art work is annually turned out from their kilns.

Pottery at the Great Exhibition.

In 1851, the contributions of the English potters showed an immense improvement on the taste of the three decades that immediately preceded it. The very long unrivalled pre-eminence of the Wedgwood classical taste seemed to show how completely the domain of taste had been abandoned, until, indeed, it seemed impossible to impress the master potters with the idea that there was such a thing as taste. They had not grasped the fact that artistic taste alone could lead to commercial prosperity. The old idea that first-rate artists were to work at some vast product of a State-subsidised manufactory, such as Sèvres, was seen to be futile; and now it is first seen that the first-rate artist can be profitably employed in producing the decorations in form and detail, the ordinary ware of the potter. Hence the movement made from this period. No doubt the production of capable men by the educational power of various schools of design, which had been at work since 1839, enabled the manufacturers to apply this simple principle and make it a practice. This period saw a return to better form, which in pottery is the first great element of beauty. Whatever may be the decoration of an object, it should be applied to a form that gives pleasure to the cultivated eye. The Wedgwood ware had, all through the dead ages of the first three decades of the century, been a standing protest against the neglect of this simple proposition, but we may date the infusion of a better spirit into the designs of our potters from the 1851 Exhibition, where Sèvres at least gave evidence of taste in form, even if the decoration of that form was not in the highest sense tasteful. It was remarked that the Copeland and Minton ware led the show in taste of colour and decoration; although the forms, as of those of

Progress, 1851 1862.

MINTON VASE: "THE SIREN,' BY M. L. SOLON.

*(From "A History and Description of English Porcelain," by William Burton, F.C.S.)*

other Staffordshire and Worcester manufacturers, were steeped in the French decadent treatment of Louis XIV. and Louis XV.

In 1855, the Paris Exhibition of Art Industries gave the critic another opportunity of comparing the various art products of France and England; and the result seems to have been that although Sèvres had advanced enormously, its productions could not sustain competition with those of ordinary trade sources from the fact that a Government subsidy takes the place of the stimulus to exertion that successful competition in trade inevitably supplies. But the common ware in France had gone on, and the first note of possible competition with our home production is now heard. In the years since 1851 the English potters had no doubt advanced; and although Copelands seemed resting on their well-earned fame, Mintons, and especially Binns of Worcester, had made distinct strides onward.

The threat of French competition had a very notable result, which led to the introduction of French modellers, and above all a French pottery chemist into Minton's works at Stoke-on-Trent, and from that time to this the influence of M. Arnoux as a scientific potter is found in the works of the firm to which he allied himself, and the modelling of Jeanest, Carrier-Beleuse, and others tended to give a forceful French style, which no doubt served to stimulate the manufacturers of Staffordshire to competition with those most able artists, and this tended to the general rise in the character of the productions of the entire district.

In 1855, the English faience gave the French potters the idea of using what is called Majolica in the trade as a decoration, and to Messrs. Minton the credit is due of having sent such a representative exhibition of works of the description as to have been the means of awaking in the French potters the desire to outdo their guests. It can, however, scarcely be said that the English potter has not held his own in subsequent exhibitions in which the two rival nations have competed against one another on this particular ground. From this time the modelling of the ware has more character, the range of colour is more free, and the traditions of the somewhat narrow forms of the old trade were boldly departed from. Majolica.

The advance of the art schools under the Board of Trade further gave the means to the advanced potters to educate their

young modellers and painters to the standard they wished to reach, and this was done at their doors, and ready to their hand. Therefore, as might be expected, the result of the whole sequence of circumstances was found to be the advance of the work of Staffordshire and Worcester. From this time onward, although Sèvres with its vast resources kept its pre-eminence in large works, yet in smaller products they were rivalled on their own ground by the Englishmen, who had struck out a new line or had so modified their old ones as to postpone the probable French competition to some far distant time; and the lesson had been learnt that it was unwise to substitute labour for art, and that the pursuit of ends that when attained were but curiosities was futile.

The Exhibition of 1862.

These points of progress were brought into prominence in the Exhibition of 1862, when with the exception of a few foreign pieces—notably Copenhagen ware, produced under the influence of Thorwaldsen, and one or two works from Paris and Austria—the English goods were commendably superior in manufacture and in refinement of taste to their foreign rivals, and it became apparent to critics that English taste will be as attractive, on the score of its refined beauty, as the more learned but less spontaneous art of France. In fact, in the eleven years since the 1851 Exhibition, our manufacturers and our purchasers had learnt the lesson that English taste had an affinity with English perceptions of what was beautiful: and the art of the potter from that time must now have been free from any largely perceptible foreign influence, although the French influence of the modellers named above still lingers in the Minton productions.

Improvements in 1871.

In 1871, the advance was felt to be a remarkable one in every way. The old heresies and false taste had practically disappeared. The handles of ewers imitating rope or reeds or flower-stalks had gone, and many most artistic and beautiful things had been introduced. An example of Minton's pâte sur pâte in the hands of a great artist like Solon became a work of art, to be counted by the collector as the best of its kind then painted. The process is simplicity itself; a coloured body is painted with the same material as the body, but is uncoloured, the thinner parts being semi-transparent. When fired at porcelain heat, it allows the darker body to show through and take the place of

shadow, while those parts which have more impasto become half-tones and lights.

"AUTUMN": A FIGURE IN PARIAN, MODELLED BY CARRIER-BELEUSE, MINTON.
*(By permission, from "A History and Description of English Porcelain," by W. Burton, F.C.S.)*

Mintons also introduced a curious application of the property that is possessed by certain pigments of seeming to change

their colour when viewed by artificial light. A celadon body appears to change to a pink when lighted artificially, and similarly a dove colour changes to crimson under the same conditions. They also exhibited an ingenious method of using hexagonal tesseræ as a means of giving a ground for wall paintings; the adaptability of the small pieces to any winding surface being a distinct gain. When fitted, these were painted with a device in ordinary enamel colours and fired and glazed in the usual way.

Earthenware.

As to the earthenware produced in England, persistent effort has produced wonderful lightness, finish, elegance, and cheapness. The substitution of harmless glazes for those made of poisonous ingredients is very satisfactory and a distinct advance. And, not least, the improvement in design and execution of the superior articles now produced is due to the mutual and individual efforts of some of the leading manufacturers, and to the instruction that has been afforded by the schools of art to the operatives and artists in the manufacturing districts. The chief centres of production remain the same as at the beginning of the period under review, but a notable change is coming over the methods of decoration; the increased use of "process" in this as in the other decorative arts is a recent peculiarity. It threatens to impair the distinctive type and style left us by the great men who have formed the English pottery-trade and name—the classic feeling in Wedgwood ware, the French influence in Mintons, the Oriental sentiment in the Derby work. Worcester alone has abandoned her traditions and gone to Japan for a new inspiration. Doulton ware is distinctive and full of character. But the tendency, at least in Staffordshire, has been to use various German processes for cheapness' sake, a downward step that at the close of our period threatened the loss of all originality and distinctive character.

"Process" Decoration.

Stoneware.

The history of stoneware begins with the first fire-burnt pottery, in all probability. Until recently, in England, it was used mainly for the manufacture of drainage pipes, chemical ware, and other useful things. The variations of tint, colour, and texture, due to the accidental firing in the salt-glaze kilns, were an objection to its use as a table or domestic ware. Hence the discovery of what is called Bristol ware—so named from the place of its first introduction. It is a stoneware dipped into a hard glaze; this equalises the various tones and tints of the

ordinary ware, and makes a smooth uniform ware that filled a demand made by the public taste, and at one time threatened the existence of ordinary salt-glaze ware.

Doulton Ware.

Up to the year 1870 stoneware had only been used in its common forms, such as those just mentioned, and for the thousand-and-one things to which this most durable ware could be applied. The utmost accuracy of manufacture had been attained by the energy, outlay, and practical skill of Sir Henry Doulton; but since the sixteenth and seventeenth centuries no stoneware had been used as a decorative material of use except the "Toby" jug, which found, and still finds, a continuous demand. There was small scope for the display of fine art—the use of stoneware vessels was confined to the humbler classes, among whom the least appreciation of a beautiful thing is to be expected. But after a few tentative experiments, in 1870–1 Sir Henry Doulton made the most original and interesting restoration of an old and lost art by the introduction of coloured stoneware produced under the difficult conditions attendant on the use of coal instead of wood, which was the German fuel of the fifteenth, sixteenth, and seventeenth centuries. The difficulties attending the colouring of this extremely hard semi-vitreous ware are mainly owing to the very high and long fire to which it is exposed, and even more to the method of glazing, which consists in throwing salt into the white-hot kiln and on to the ware. This is decomposed, and the soda attaches itself to the silicious ware, and a perfect glass glaze is formed in the very texture of the body itself. Needless to say, this is a very trying and destructive process to all colours: hence the small choice of pigments that will withstand the ordeal. Few as they are, they were fewer still in the sixteenth and seventeenth centuries, when old German stoneware was brought to its highest point. As an art product the new Doulton ware surpassed the old in greater freedom of design and greater variety and choice of pigments; in addition to these, many methods of adding to the surface of the ware were adopted by the use of moulds and moulded medallions, applied by the fingers of the artists. The result was a remarkable ware that made its way in the appreciation of connoisseurs and collectors, and, further, had very considerable ordinary sale as the product of a new and attractive art. The highest recognition in the more recent Continental exhibitions

gave evidence of the thorough success this beautiful ware has had with the greatest critics of France and Austria. Originality, taste, and modern adaptations of old principles mark the characters of this fine manufacture. The flexibility with which the ware has been applied to objects of architectural decoration, such as drinking-fountains, also string mouldings for buildings, and sometimes for the ashlar work of vast erections, is a proof of the modern spirit of enterprise which it illustrates. In this particular manufacture no competition exists, for the product is

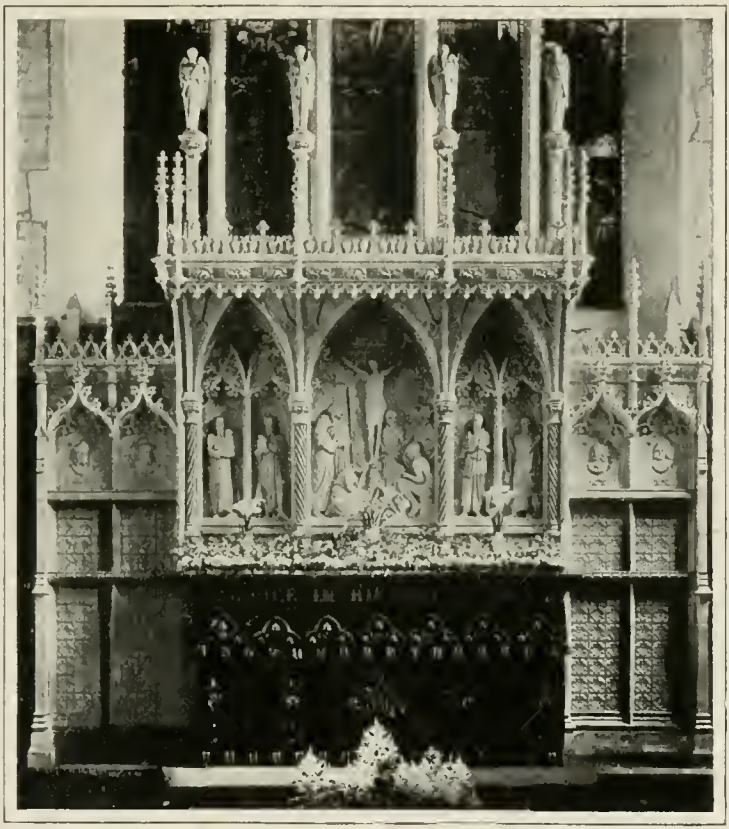
TWISTED THROWN PIECES IN COLOURED SALT GLAZE STONEWARE.
(*From a photograph supplied by Messrs. Doulton.*)

solely made at Lambeth by the talented discoverer of the possibilities of the ware in its new applications. But it is necessary to point out the competition that threatens, especially in Germany,[1] where the stoneware forms and colours are copied in a soft lead glaze on a Majolica body, and can be sold for a quarter of the cost of the original ware. In this department of trade the gravest sins against consistency are enacted, to the great harm and damage of the national product.

**Bricks.** As regards brick-making, no doubt certain patents in the last century indicate that an attempt was made to form bricks by the pressure on the clay as it came from the pug-mill; but any real improvement in the matter must be sought in the first third

[1 Written in 1896.]

of the century, especially from 1830 to 1840, when machinery was applied to almost every branch of manufacturing industry, and the various patents of those years, and later, show great



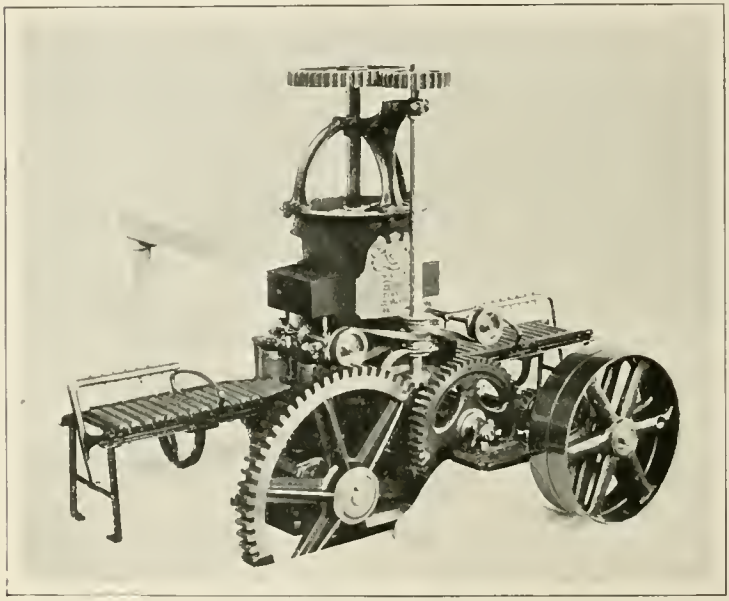
THE REREDOS, ST. MARY'S CHURCH, LAMBETH, MODELLED BY GEORGE TINWORTH.

(*From a photograph supplied by Messrs. Doulton.*)

activity in this handicraft; so that the output of the brickmaker with his three or four attendants, making 7,000 bricks a day, has been exceeded tenfold. In 1851 a pierced brick was introduced that was a distinct improvement for many kinds of work, and moulded bricks were extensively made and used for the second class of builders' work.

Terra Cotta.

As a natural extension of the brick-making industry terra-cotta claims notice. It is no doubt the natural form and material for the decoration of brick buildings, and has been employed as an architectural material from the times of ancient Greek art almost continuously to our own times: it was especially developed in the north of Italy and the north of Germany in the time of the later Gothic and early Renaissance



BRICKMAKING MACHINE.
*(Victoria and Albert Museum.)*

periods. The problems that were solved by the manufacturers of those days remain the same to-day.

In the 1862 Exhibition were first seen architectural details in terra-cotta—*i.e.* cornices, string courses, capitals, and panels, pressed in moulds of excellent sharpness, and rivalling in their definition similar architectural features in stone. No doubt terra-cotta, in a sense, has been always used, and terra-cotta figures, as an economy from the cost of carved stone or marble figures, were not uncommon. For generations artists had perceived the advantages of clay modelled or moulded and burnt,

with every touch fixed for ever as the clay left the artist's hand and this character should be kept in mind. But, unfortunately it is comparatively rare to find architects who have risen to a thorough appreciation of the peculiar character of the treatment necessary to take full advantage of the limitations of the material. Of some modern designs it might be said that they would have been far better if worked out in stone. The buildings in this country that are thoroughly consistent stand as examples of what may be done in this durable and beautiful material.

The manufacture is now one of large importance in the Midlands, and in Leeds and London, where work is done that has been hitherto unattainable for texture, colour, and accuracy. Very large buildings have been built and decorated, two of which may be mentioned: the Albert Hall, and the Natural History Museum—both at South Kensington. Various shop buildings and private houses have been admirably decorated by the designs and original modelling of men of note. Among the best are the remarkable works by the firm of Doulton's of Lambeth, a noted instance being the Birkbeck Bank,[1] designed by Mr. T. E. Knightley, a building probably unique in the history of the potter's art.

A very large trade has sprung up in fire-clay goods made from the clay found in the iron-measures of Staffordshire and Yorkshire. Very large quantities of what are called Stourbridge clay goods are made for crucibles, gas-retorts, fire-bricks, and other purposes, and especially for seggars, which are the cases in which the finer wares are enclosed to protect them from the direct impact of the flame in firing. Somewhat old traditions prevail in this branch of the trade, and it is certain that American and other potters are becoming aware of the need of a quicker and better way of making seggars. Asbestos has been substituted for ground shards at Messrs. Doulton's with promising results, and no one can quite say what the future of

[1 The portion first erected (1894–95) in Southampton Buildings, Chancery Lane, is rich in terra-cotta statuary, the architectural work itself being in Doulton's "Carrara" stoneware of various tones of colour. The front in Holborn, erected 1899–1900 (here illustrated), is entirely in white stoneware. A more recent erection (1904) in Doulton's "Carrara" Stoneware is the immense frontage in the Strand of the Savoy Hotel, London, made to the designs of Mr. T. E. Collcutt.]

the large and subsidiary industry will be, but advance in methods is certainly to be reckoned on.

Thus the progress in manufacturing skill and resource, as

HOLBORN FRONT OF THE BIRKBECK BANK.
(*From a photograph supplied by Messrs. Doulton.*)

well as the advance in taste, were continuous from 1851 to the end of our period, and an industry has been established by the energy of our master potters on a scale hitherto unequalled. The export trade had increased gradually until 1885, but at that time evidence was not wanting to show that in this industry as in others our former customers had become

our rivals, and that the outlook for continued prosperity in the pottery trades was not so bright as it had been.

W. G. RHODES. Applications of Electricity, 1815–1885.

The idea of an electric telegraph dates back into the eighteenth century. In 1774 Lesage constructed a telegraph consisting of twenty-four wires with pith-balls at their extremities. In 1816 Ronalds simplified Lesage's arrangement by using one wire only; and in 1828 Dyar, of New York, invented a method of recording messages. In all these attempts frictional electricity was used, and none attained success. After Volta's introduction of current electricity the idea was revived. Attempts were made to apply Davy's discovery, that an electric current could decompose chemical compounds, to systems of telegraphy. It was not until Oersted discovered that a suspended, or pivoted, compass-needle is deflected by a suitably-placed electric current that telegraphy gave any promise of practical success.

Ampère (p. 252), who did so much towards the development of electro-magnetism, first suggested the application of Oersted's experiment to telegraphy. His idea was to have a number of wires carrying electric currents, and to each electric current two magnetic needles—one at the beginning of the line, and the other at the end. It was found, however, that when the line was long the ability of the current to deflect a magnetic needle was diminished to such an extent that for a time telegraphy remained at a standstill.

In 1832 Schilling, a Russian, devised a system of telegraphy in which thirty-six needles were used. In 1833 Gauss and Weber, two German physicists, established a telegraph line about three miles long at Göttingen. This line was used mainly for experimental purposes. The practical development was left to Steinheil, who constructed several telegraph lines radiating from Munich, and who was the first to make use of the earth as a return circuit.

The placing of the electric telegraph on a firm financial basis in England is due to Professor Wheatstone, of King's

[1 It may here be mentioned that the writer of this section was the teacher of Mr. George Tinworth, and started the art section of Messrs. Doulton's works in 1870–71 with his own students from the Lambeth School of Art, which supplied the workers exclusively for a considerable time.]

Wheatstone's Telegraph.

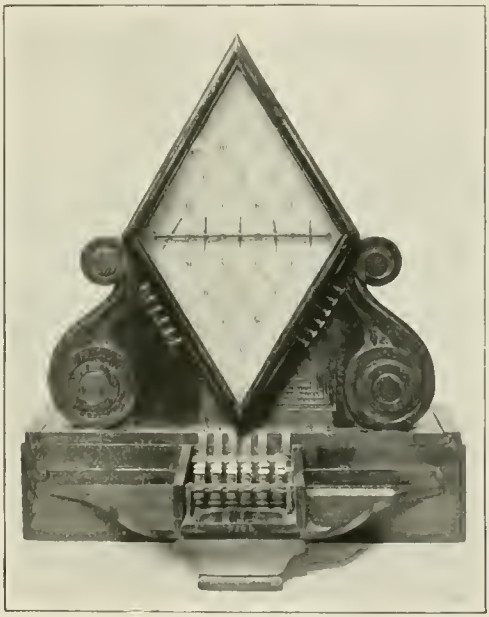
College, London, and to his partner, Mr. W. F. Cooke. They took out their first patent in 1837. Wheatstone was chiefly responsible for the scientific part of the work, while Cooke undertook the business arrangements. As described in their first patent specification, their system required five needles and six wires, one of the wires being used as a common return for the other five. By various combinations of the five needles all the letters of the alphabet and the numerals could be represented. Soon, however, Wheatstone found that five needles were unnecessary, as a code could be devised for representing letters and numerals and as many words as one pleased by means of a single needle. In 1840 he invented a dial instrument, on the face of which were the letters of the alphabet.

In all applications of electricity to commerce the questions of simplicity of arrangement and cost determine whether or not the venture will be a practical success. These considerations induced Wheatstone to abandon his five-needle telegraph for a two-needle or a single-needle telegraph. Where the needle system has survived other improved forms, the single-needle instrument is almost universally employed. If the current traverses the line in one direction the needle swings to the right, and on reversing the direction of the current by a suitable key, or contact-maker, the needle swings to the left. The letters of the alphabet and the numerals are represented by combinations of swings of the needle to the right and to the left.

The first public telegraph in England was established in 1844 between Paddington and Slough, a distance of twenty miles. The wires were suspended from posts along the Great Western Railway. The needle telegraph was for some years almost exclusively used in England. In other countries, however, it was soon supplanted by a system due to an American named Morse, which has now almost universally superseded all other systems, except in submarine telegraphy, in which the needle system is still used. The basis of the Morse system (1838) is the electro-magnet, as constructed by Sturgeon and improved by Henry. Its advantage lies in the ease with which a permanent record of telegraphic messages is obtained. The "key," or sending apparatus, is such that in one position the circuit through the receiving apparatus is complete, while in another position signals

The Morse System.

are transmitted. The receiving instrument or indicator consists of an electro-magnet, one end of the magnetising coil being connected to the line-wire and the other to earth. As the key is pressed down at the sending end, the current sent through the line to the receiving end magnetises the soft iron of the electro-magnet, attracting a soft-iron "armature" carried at one end of



FIVE-NEEDLE INSTRUMENT PATENTED BY MESSRS. COOKE AND WHEATSTONE IN 1837.

*(By permission of H.M. Postmaster-General.)*

a lever, which is pulled back by an opposing spring when the current ceases. At the other end of the lever there is a point which presses on a strip of paper, marking it whilst the current is passing. The intervals between these marks represent the interruptions of the current. A clockwork, put in motion by a spring, drives a pair of rollers, which draw the strip of paper past the pen so that it receives the series of marks which make up the message. If the current is momentary a "dot" is made on the paper, but if the current flows for a longer time a "dash" is produced of about three times the length. At first a pencil was

used as the tracing-point, but the point soon became blunt, so that a metal point was substituted. This method demanded a force which the battery-current from the line was generally too feeble to produce. To remedy this defect a "relay" was introduced. This sends a strong local current through the receiving instrument when actuated itself by a feeble line-current, and consists simply of an electro-magnet having many turns of wire, so that the feeble line-current magnetises it sufficiently to attract a soft-iron "armature," which, when attracted, closes a local circuit containing a battery and the receiving apparatus.

In the Morse code letters, numerals, and signs are represented by combinations of dots and dashes. The first Morse line was laid between Washington and Baltimore in 1844. The wires were placed underground, but this was soon abandoned, and afterwards they were mounted on poles.

Between the years 1840–50 the growth of the electric telegraph was very rapid. The rapidity of its growth necessitated either laying many more lines or the adaptation of those already laid to cope with the large number of messages to be transmitted. It was this need which caused various electricians to devise systems of multiplex telegraphy, by which the same line could transmit two or more messages simultaneously. In 1852 Farmer, an American, brought out such a system, though not a very good one. The method at present in use for multiple transmission was first suggested by Gintl, of Vienna, in 1853. It was not, however, until 1872 that a successful system of duplex telegraphy was introduced by one Stearns, of Boston. In duplex telegraphy signals may be simultaneously transmitted at both ends of the line, each end simultaneously receiving what the other transmits. An improvement on Stearns' system was brought out in 1874 by Mr. T. A. Edison. There are two methods of duplex telegraphy: the differential method and the bridge method. In 1874–5 Elisha Gray, an American, designed a system of multiplex telegraphy for the simultaneous transmission of several signals. In principle the system depends on the synchronism of sonorous vibrations propagated by electric currents. The name "harmonic telegraph" has consequently been given to the system. All these multiplex systems are modifications and extensions of the Morse system. Amongst other systems of telegraphy may be mentioned Professor Hughes's printing telegraph, and the

Multiplex Telegraphy.

autographic telegraphs of Meyer and Caselli, which were brought out in 1881.

Submarine Telegraphy.

As early as 1839 Mr. O'Shaughnessy connected the two banks of the Hooghly river in India by an insulated wire plunged into the stream. In 1840 Wheatstone proposed to connect Dover and Calais by a submarine telegraph cable, but the project was not realised until 1850. After transmitting a few signals this cable broke. A new cable was laid in 1851. The difficulty in submarine telegraphy was in obtaining a covering for the wire both as a protection and as a good insulator. The difficulty of insulation was overcome by the use of gutta-percha,

SECTIONS OF THE SECOND AND THIRD ATLANTIC CABLES.
(*Victoria and Albert Museum.*)

whilst the cables were strengthened by surrounding the gutta-percha covering by a thick layer of tarred hemp, which, in its turn, is covered and protected by galvanised iron wires twisted round the core. The first cable insulated by means of gutta-percha was laid in 1848, across the Hudson river, from Jersey City to New York. During the next few years many submarine cables of increasing lengths were laid, and in 1857 an unsuccessful attempt was made to connect the New World with the Old by an Atlantic cable (p. 182). The next year the cable was laid, but only about four hundred messages were transmitted before it ceased to act. Another trial was made in 1865, when the ship used was the *Great Eastern* (p. 454). After about two-thirds of the distance was run the cable broke. The following year a complete cable was successfully laid, and that of 1865 was picked up, joined, and finished.

The weight of an Atlantic cable is something enormous: that connecting Valentia and America weighs 4,300 tons.

Ordinary telegraphic instruments are not sufficiently sensitive for the feeble currents transmitted to the end of a long submarine cable. In place of the ordinary needle-receiver a Thomson mirror-galvanometer is used. Thomson's galvanometer has, however, the disadvantage that no trace of the message transmitted is left. To remedy this defect Sir William Thomson (Lord Kelvin, pp. 580, 711) invented his siphon recorder, which converts the signals of the mirror-galvanometer into curves drawn on a slip of paper. No one man has done more than Lord Kelvin towards making submarine telegraphy a practical success.

**Telephony.** The idea of transmitting sounds by means of electricity dates back to the year 1837, when an American physicist, named Page, observed that when substances are magnetised they emit a sound. De la Rive, Gassiot, and Marrian observed the same phenomenon. Philip Reis was the first to notice that electric currents could impose upon a mass of iron vibrations other than that of the bar itself. In 1860 he invented a telephone based on this principle, by which he managed to transmit both words and music, though in an imperfect manner.

In 1876 Graham Bell, a native of Edinburgh, invented the magneto-electric method of transmitting sounds. In Bell's telephone the voice itself generates the electric currents by causing a diaphragm in the transmitter to vibrate and operate a magneto-electric induction apparatus; these induced currents operate on a similar apparatus in the receiver, which causes a diaphragm in the receiver to vibrate in a similar manner to that in the transmitter. On the same day that Bell patented his telephone Elisha Gray, an American, applied for a patent for a similar instrument. Since Bell invented his instrument the arrangements of the receiver and transmitter have been improved by various physicists, with a view to intensifying the effect in the receiver. Of these improvements the most important is due to Professor Hughes, and is the result of a discovery made by him in 1878, that if a piece of carbon be allowed to rest upon another, and an electric current be passed from one to the other in a circuit containing a Bell telephone receiver, the latter will respond to very minute sounds in the vicinity of the carbons. The arrangement, as invented

by Hughes, is called a "microphone." The transmitters generally in use at present contain microphonic arrangements.

**Generating Electricity.**

The cell which Volta discovered in 1800, and which consisted of plates of zinc and copper dipped into dilute sulphuric acid, was far from being perfect. After sending a current for a short time the strength of the cell diminished owing to the collection of bubbles forming on the plates. To remedy this defect was the aim of physicists for a long time. In 1836 Professor Daniell brought out a battery of constant strength, in which two fluids are used. Many other forms of constant batteries have been devised by using different liquids and different metals.

**Secondary Batteries.**

In Volta's original form of cell the bubbles of gas forming on the plates not only diminish the effective surface of the plates, but also act as the seat of an opposing electro-motive force, which has been called the electro-motive force of polarisation. In 1803 Ritter suggested that this effect of polarisation should itself be used to drive an electric current. In 1843 Grove constructed a gas-battery to illustrate the operation of polarisation. In 1859 Gaston Planté experimented on many metals to see whether polarisation could be made use of in the storage of electrical energy. He discovered that plates of lead immersed in dilute sulphuric acid produced strong polarisation effects. After passing a current for some time through such a cell, he was able to take large currents from it for a considerable time. This discovery is now extensively used for the storage of electrical energy. Cells formed thus are called "storage cells," or "secondary cells." As compared with primary batteries, they have both a higher electro-motive force and a less internal resistance, so that very large currents can be taken from them.

**Dynamo-Electric Machines.**

Electricity is now generated in large quantities by means of the "dynamo," the origin of which dates back to Faraday's experiment (p. 225), with a disc rotating between the poles of a permanent horseshoe magnet. In 1832 Pixii, of Paris, replaced the copper disc by an electro-magnet of the horseshoe form, and rotated a permanent magnet opposite it, so that induced currents could be obtained from the coils of the electro-magnet. In this form the induced currents would be "alternating," that is, they would flow first in one direction

through the coils and then in the other. To make the current retain the same direction in the external circuit Pixii devised a "commutator," an arrangement which rectifies an alternating current. Many inventors brought various improvements in these induction machines, but no considerable advance was made till Dr. Werner Siemens, of Berlin, invented in 1856 a particular form for the rotating coils, known as the "Siemens Armature." The magnetic field was still produced by means of a permanent magnet. The next step of importance was due to Wilde, of Manchester, who replaced the permanent field magnet by an electro-magnet which was separately excited by a small permanent magnet machine. The idea of making use of the machine's own currents to magnetise its own field-magnets occurred first to Brett, then to Hjörth, and then to Varley, who patented a machine on this principle in December, 1866. The same idea occurred simultaneously to Wheatstone and Siemens early in the year 1867. In 1870 Gramme, of Paris, developed a method of winding the "armature," which was in the first instance due to an Italian, named Pacinotti. The method consists in winding the armature conductors round an anchor ring of soft iron. This type of armature and one known as the "drum" armature are those now principally made. Many inventors have been at work on the production of dynamo-electric machines, which have been brought to a high state of perfection. Whereas the old type of machine with permanent steel magnets might have an efficiency of 25 or 30 per cent., the most modern dynamos can be built to give efficiencies of over 90 per cent.

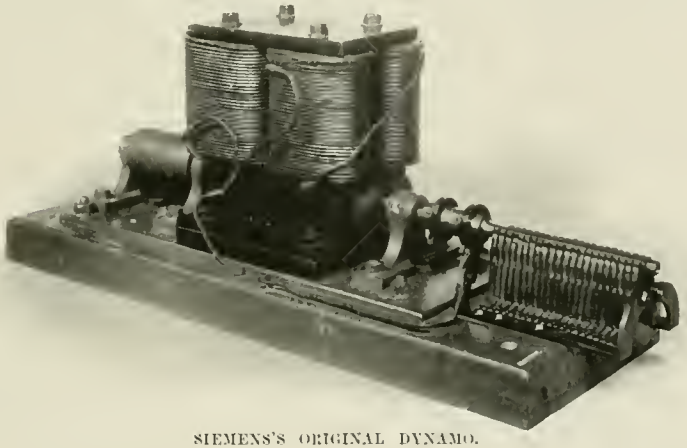
**Electric Motors.**

Perhaps one of the most interesting, as well as one which promises to be among the most useful, discoveries of modern times is the capability of reversal of a dynamo-electric machine. Faraday had shown that rotation could be produced by an electric current. A dynamo converts mechanical energy into the energy of an electric current. If a current is sent round the armature of a dynamo at rest, it will cause it to rotate and give out mechanical work, or the dynamo will run as a motor. Where there is a plentiful supply of electricity machines are run as motors for workshop purposes.

It has already been stated that the first to discover the Voltaic arc was Davy (p. 249). Until the year 1844 nothing

Electric Lighting.

further was done towards raising this discovery above the experimental stage. In 1844, however, Foucault effected an improvement by substituting for charcoal pencils sawn from the hard carbon which is found encrusting gas-retorts, and in recent years still better forms of pencil have been produced. In 1846 Staite devised an arc-lamp. This lamp, however, was a failure, owing to there being no arrangement for keeping the carbon points at a proper distance apart during the process of combustion. The necessary addition



SIEMENS'S ORIGINAL DYNAMO.

*(Victoria and Albert Museum, by permission of Messrs. Siemens Bros. & Co.)*

was made by the same inventor in 1847, and still further improved by him in 1848. This regulating apparatus was still further improved by Foucault in 1849. As it is difficult to construct arc-lamps of illuminating power less than 400 or 500 candles, their use is confined mostly to the illumination of large open spaces or for lighthouses. Their introduction for purposes of illumination led to the development of dynamo-electric machines. The first occasion when electric light was used for illuminating lighthouses was on December 8th, 1858, when the High Light at the South Foreland was lit by electric currents. In 1863 the electric light was applied to the lighthouses of La Hève, where an illuminating power equal to 475,000 candles is obtained, and the light is seen at the distance of twenty-seven nautical miles.

Electric lighting by incandescence dates from 1841, when

a lamp was constructed by De Moleyns, an Englishman, the light of which was due to the incandescence of a platinum wire. In 1857 De Changy tried thin slips of bone charcoal, enclosed in a vacuum of glass globes. Charcoal was found to be a great improvement on platinum. Edison used a filament

*Photo: J. Thompson, Ventnor.*

ST. CATHERINE'S LIGHTHOUSE, ISLE OF WIGHT.

made of bamboo fibres, carbonised by a special method, and placed in a glass bulb, in which there is a nearly perfect vacuum. These lamps were exhibited with success at the Paris Exhibition of Electricity in 1881, and again at the Crystal Palace Electrical Exhibition of 1882. It now became evident that electric lighting was obtaining a firm footing on a commercial basis, and in consequence Parliament passed, in 1882, the "Act for Facilitating Electric Lighting."

**Electro plating.**

Davy's discovery, that an electric current could be used to decompose chemical compounds and deposit metallic elements, led to the large industry of electro-plating and electrotyping. The pioneers of these processes in England on commercial lines are the house of Elkingtons.

H. RIDDELL. The Textile Industries, 1851-1885.

THE cotton trade of Great Britain had reached a condition of great prosperity and vast magnitude at the time of the Great Exhibition of 1851. Nevertheless, a want had been felt in preparing for the finer spinning, and this want was supplied by an important machine exhibited at the great show.

For fine spinnings it is always necessary to select fine, long-fibred cottons, but prior to 1851 English spinners were confined to the very highest grade of material, long, silky, and with fibres particularly even in length. The introduction of the combing machine changed this to a very considerable extent. The machine now selected the fibres, rejecting those of unsuitable length, and laying the remainder parallel to an extent never approached by the card. It is no wonder, therefore, that the new process was eagerly adopted by leading firms in the cotton trade.

Cotton: The Combing Machine.

This machine was the invention of Joshua Heilmann, and was probably a development of the wool-combing machine of the same inventor. It was exhibited for the first time in England in 1851, and a syndicate of English spinners at once purchased the patent rights for this country, and most wisely entrusted the manufacture to a firm already famed for their cotton-spinning machinery. The price paid for the patent is said to have been £30,000, and there is no doubt it was found a most remunerative speculation. For a time its use was confined to members of the syndicate, but after their wants were supplied it was sold to the trade generally under a heavy royalty. The machine is very ingenious and complicated, though now much simplified and improved by alterations suggested from experience in working. It is not easy to over-estimate the effect of this combing process upon the trade in fine spinnings. In spite of the very great delicacy and perfection of the mechanism of the modern carding engine, and the corresponding improvement in the resulting sliver, the combing process is still indispensable to the production of very fine numbers.

Ring Spinning.

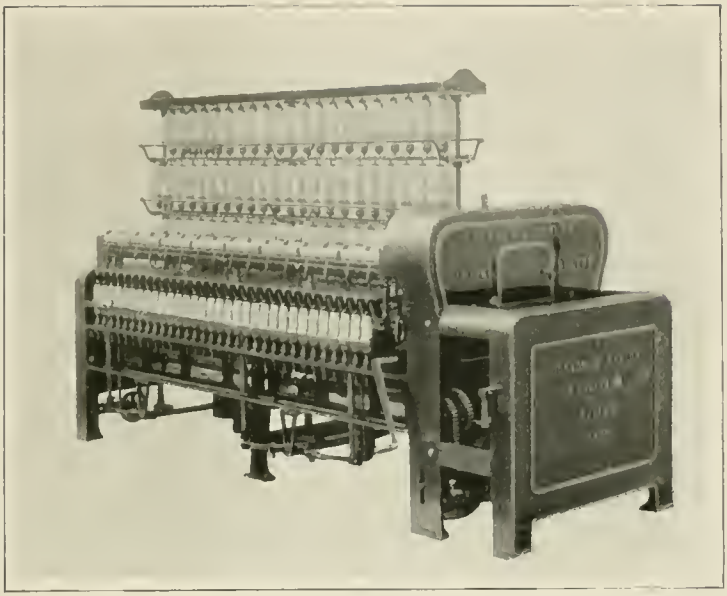
There are not many more improvements in spinning machinery to note between 1851 and 1885, but there is one of them which is of such revolutionary importance that it is worthy of a more detailed treatment than it can receive in this page. No modern improvement has had results of

greater magnitude or more wide-reaching importance than the introduction of ring spinning. This beautiful invention, which removes the flier from the spindle and links it directly to the yarn in the form of a small loop of wire, also relieves the thread from the duty of dragging round the bobbin. Thus it becomes possible to drive the spindle at speeds at which fliers could not safely be used, and to limit the drag upon the yarn to that actually needed to wind the thread upon the bobbin. It would have been impossible to take advantage to the fullest extent of these added powers but for the patience, ingenuity, and skill with which different inventors have worked for the improvement of the spindle. Their efforts have been directed towards obtaining a self-contained spindle, which could be driven at the highest speeds with a minimum of vibration, and possessing the power of self-balancing to a considerable extent if loaded unevenly when running. The success which has attended such efforts has been so great that spindles may be seen spinning fine yarns and running at a speed of 13,000 revolutions a minute. Such high speeds of course brought difficulties of different kinds, but these were overcome by a constant succession of improvements, until the process became, at least for warps, a complete and unqualified success.

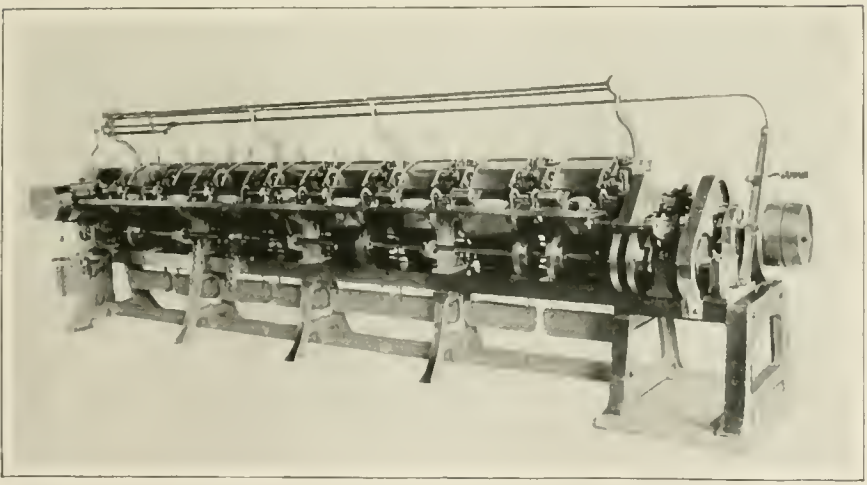
Ring spinning was invented as early as 1830, was first adopted in America, and there brought to a state of comparative efficiency, but it was not until the year 1866 that it was introduced into the English trade as a practical factor in the production of warps.

**Growth of the Cotton Trade.**

There have been many causes at work cheapening the manufacture of textiles altogether unconnected with improvements in the processes and machinery employed in spinning and weaving. The great improvement in the means of communication with foreign countries has brought large supplies of raw materials to England, and the great increase in demand for such raw material has stimulated production until prices have reached a comparatively low level. The discovery of the aniline colours and the great improvements in dyeing and printing have had much effect. It is impossible to estimate separately the power of each improvement in detail, but it is easy to follow the figures showing the actual increase in the cotton



RING SPINNING MACHINE.



COMBING MACHINE.

(*From photographs supplied by Messrs. Dobson & Barlow, Bolton*)

trade. Thus, in 1851 there was consumed in Great Britain a quantity of cotton weighing 659,000,000 lbs. This had increased by 1855 to 840,000,000 lbs., and in 1860 reached 1,084,000,000 lbs. Then came the terrible years of the American Civil War, during which consumption fell to little more than one-third of the figures of 1860. After the conclusion of peace in 1865 the importation of cotton at once began again to increase, reaching in that year to 723,000,000 lbs., and showing in 1870 a consumption of 1,078,000,000 lbs., in 1875 of 1,228,000,000 lbs., while in 1885 the consumption was about 3,500,000 bales, or 1,400,000,000 lbs.

Of course England has not been alone in thus advancing. France, Germany, Russia, the United States, and even far-off Eastern lands, such as India, China, and Japan, have eagerly joined in the race. But in spite of the continued efforts of foreign nations, this country has retained the leading position. The average value of British cotton manufactures exported was, for the five years 1880–84, more than £75,000,000 per annum

Linen, 1815-1885.

There is not the same story of rapid progress to be told regarding the linen trade. The changes have been many and striking, but the trade has not increased with the extraordinary rapidity shown by its competitor. There are many reasons why this should be so. The production of the raw material is much more expensive, and at the same time much more variable both as to quantity, quality, and price. Therefore linen has become rather a luxury than a necessity for the greater part of purchasing humanity. There is also much greater difficulty in working the hard, inelastic linen yarn in the power-loom, and more trouble met with in spinning than in the case of cotton. Considering, then, the disadvantages under which the manufacture is conducted, it is not to be wondered at that it has not progressed "in leaps and bounds."

The process of flax spinning by machinery was already old in 1815, the first introduction dating apparently from 1787, when a mill was erected in Darlington. While this is true, it was but slowly developed; and in 1815 almost all the yarns employed in the manufacture of anything but the coarsest fabrics were hand spun. Hand spinning is not yet quite extinct, and yarns have been spun by female workers in this way

which have surpassed in fineness anything which the spinning mill has been able to produce.

The power-loom was very slowly introduced into the linen weaving trade. The advantages were not nearly so obvious as in the case of cotton, and even at the present time hand-looms compete successfully with power-looms in some branches of the trade. It was not until 1821 that power-looms were adopted in the ordinary linen manufacture, while their use in Ireland came very much later. As that country is now the main seat of the linen manufacture, the few figures given later will refer chiefly to the Irish trade.

**Irish Linen.**

In 1815 the value of linen cloth sold in the markets of Ulster amounted to about £2,400,000, a statement which shows at once that the trade even then was a large one. Although flax spinning by machinery was introduced into Ireland on a small scale early in the century, it was not until 1829 that the first step was taken in the modern development of the Irish trade. The old York Street cotton mill in Belfast was burned in 1828, and the Messrs Mulholland at once proceeded to re-erect the building. While the structure was steadily rising the owners had their attention directed to the fact that flax was leaving the port for Leeds, where it was spun into yarn and returned to Ireland to be woven into linen. With true enterprise the opportunity was seized, and the new York Street mill was filled with flax-spinning machinery, and the foundation was laid of a business which has grown to gigantic dimensions in the hands of Messrs. Mulholland's successors. Almost at the same time a mill was built in Castlewellan by Messrs. Murland, who thus share with the Mulholland family the honour of being pioneers in the trade which is now most distinctively Irish. The progress of the spinning industry was so rapid that in 1841 there were in Ireland 250,000 spindles, while in 1851 they reached a total of 390,000. The trade in those early days was exceedingly prosperous and lucrative. The prices of mill-spun yarns at the time of the first Irish mills ran very high. For 40's 13s. 3d. per bundle was paid, and for 60's the price was 11s. 3d. In spite of the inferior skill of the workers and the lower class of the machinery, the trade was profitable. So far, however, was Ireland from possessing the preponderating interest which she now does, that Scotland

in 1850 had already 303,000 spindles, and England actually owned 365,000.

The weaving trade showed a still greater proportion against Ireland in the early days of the industry. In 1850 Ireland only possessed 58 power-looms on linen, while in Scotland there were working 2,529, and in England 1,083.

Up till the year 1851, then, Ireland had taken only a respectable position in the development of the treatment of flax by power, but it must not be forgotten that the great bulk of the fine linens in use were Irish hand-made, and that the trade in such goods was then of exceedingly large proportions, and that the value of the linen manufactures exported from the United Kingdom in 1851 was more than £4,100,000. Many causes combined to bring about this comparatively slow advance. As has already been said, the inelasticity of the flax fibre made it much more troublesome than cotton, so that many difficulties peculiar to the fibre were met with, and required to be overcome. It cannot even yet be said that the methods and machinery of flax spinning have reached the same perfection as in the cotton manufacture, but the advance since 1851 has been very considerable.

The preparing machinery had been generally remodelled, very great attention having been paid, especially to the hackling and roving. In the former of these processes all real development has been from Irish inventors, while in the roving machinery Leeds and Belfast have been constant rivals in construction.

It was in working out his invention of the expanding pulley in the flax roving frame that Combe originated the modern system of rope driving for mill purposes, this exceedingly useful idea dating from 1856.

The general adoption of the hot water process in spinning and the constant call for finer numbers have led to all the modern mills being fitted with machinery of a class suitable for such work, and thus to the comparative disuse in Ireland of dry spinning. Spindles and bobbins are smaller, and speeds are much higher than formerly. The use of ring spinning is, perhaps, the great improvement to which the trade is inclining, but its success has been very partial, and confined to a very few mills.

COTTON PREPARATION IN INDIA.

*(From photographs by permission of Messrs. Dobson & Barlow, Bolton.)*

Bleaching.

Bleaching and finishing have been greatly cheapened, and as far as appearance goes, have been brought to a high state of perfection. It is questionable, however, if any of the modern methods give a cloth of as natural and durable a texture as the old process of grass bleaching. Ireland has more than held her own since 1851 in both spinning and weaving, increasing rapidly, indeed, the number of the power-looms in use.

In 1885 the numbers of spindles and power-looms in Great Britain and Ireland were—

| | Spindles. | | Looms. |
|---|---|---|---|
| England and Wales ... ... ... | 117,000 | ... | 4,061 |
| Scotland ... ... ... ... | 221,000 | ... | 21,626 |
| Ireland ... ... ... ... ... | 817,000 | ... | 24,300 |

Thus the linen manufacture was declining in Great Britain, while it still maintained its strength in Ireland.

Jute.

Jute is not one of the fibres well known to the early textile workers, but is a very modern importation. The first parcels were introduced into Dundee in the year 1822, but found no manufacturer able or willing to make any attempt to work them, and this particular lot was afterwards sold for mat-making. In the following year, however, Messrs. Baker and Meldrum received another consignment, which they succeeded in spinning, and thus became the pioneers of the great Dundee jute trade.

To the Dundee spinners the difficulty in handling the fibre was less than to most of the manufacturers in other districts. They had been trained in working with coarse linen yarns, and at first adopted with some success similar methods in their treatment of jute. They began by spinning it in the same way as coarse linen line: that is, with fibres either in their full length of six or seven feet, or cut somewhat shorter, and worked upon the same machines as were used for the production of the coarse linen yarns. To a very small extent this method is still in use for special yarns, but it was soon found that, for the fabrics for which jute was most suitable, it was better to use rather the tow methods of spinning, and to break all the fibres upon cards, instead of hackling and spreading as for flax. A rapid advance upon the machines in use for carding, roving, and spinning was made by the great machine makers, prompted by the practical experience of the manufacturers, and the different cards and

roving and spinning frames now employed in the trade are very perfectly adapted for their work, both in design and construction. Of course the experience gained in the flax trade was of immense advantage, and every machine employed has its counterpart, more or less resembling it, in that manufacture. Nevertheless, great changes were necessary, and such firms as Lawson or Fairbairn of Leeds, Combe of Belfast, or Low of Monifieth, among others, did immense service in this respect.

As there was no startling innovation to chronicle, it is sufficient to note results. The trade progressed slowly at first, but afterwards very quickly. Thus in 1829 the import of jute from Calcutta was 364 cwts., in 1830 it amounted to 1,776 cwts., and by 1832 reached 23,852 cwts. In 1833 the import was nearly 26,000 cwts., making a total for the five years of 59,000 cwts., or about 3,000 tons. During the next five years, ending in 1838, the import was nearly 17,000 tons; and twenty-five years later, for the five years ending 1863, the import reached the large figure of 242,000 tons. The progress steadily increased, so that the consumption in Dundee, which during the five years just mentioned had averaged 40,000 tons a year, was in the one year 1883 about 200,000 tons. The trade has thus been the growth of comparatively a short period.

This great achievement may be viewed from another point, as regards the employment given, and the money-value of the production. Thus, in 1862, to go back only to the year of the second great English Exhibition, there were in Scotland twenty-seven factories, with 30,538 spindles and 554 power-looms. These factories employed 5,418 persons. As a means of employment the trade was even then of considerable use, but how much more so in 1885 can be estimated from the fact that in this year there were in Scotland alone 105 factories, with 235,429 spinning-spindles and 10,856 power-looms. The number of persons employed was then 36,269.

Turning now to the money-value of the manufacture, the increase is quite as remarkable. In 1862 the total value of jute manufactures of all kinds exported was about £231,000. In 1870 the value was nearly £2,000,000, in 1885 it was about £3,000,000. While it is not easy to trace the influence of any one cause upon this great addition to Scottish trade, it is still certain that a very large measure is due to the continuous

improvement in the machinery and processes employed. Without this improvement the new material could not have been made sufficiently cheap and good to create for it such a market. It must, therefore, be largely credited to such causes, and for this reason the results have been dealt with in some detail.

**Worsted and Woollens.**

It is not necessary to say much concerning the progress of the worsted and woollen manufactures; not because of any want of importance in the subject, but because it followed, to a large extent, the same course as other manufactures already treated. It is the case, however, that new or changed methods and processes have had rather a large share in the history of these trades, and deserve mention. The woollen trade is a very ancient English possession (Vol. II., p. 742), and had attained a condition of considerable prosperity long before 1815. About this year was introduced the practice of recovering the wool from old rags and waste and reworking it. This "shoddy" trade is often mentioned with contempt, yet it is a source of considerable national wealth, and the material is very valuable when used properly and for suitable cloths. Its extent is very great, about 125,000,000 lbs. of shoddy being made into cloth every year in England alone. This is so large a proportion of the total manufacture of wool, that it is really difficult to imagine the condition of trade if it were withdrawn. An immediate and startling advance in prices would be certain; and such an additional source of supply for raw material is almost indispensable.

There are not many inventions peculiar to the machinery used in the manufacture of wool, but the modifications to suit the fibre are of great importance. The "gills" or travelling bars of comb teeth are common also to the linen trade, while the combing machine is shared with the cotton-spinning in particular. The invention and perfection of this machine marked a great advance, and there are three inventors to whom it is specially due: Lister of Bradford,[1] Donisthorpe of Leicester, and Heilmann of Alsace. Of these, Heilmann seems to have secured priority, but all three have done much to advance the combing process into favour. In spinning, the one machine peculiar to the wool trade is the cap frame, resembling the ring frame in the absence of a flier, but providing no substitute. This machine has been tried in the cotton trade, but abandoned for reasons which have

[1 Created Baron Masham in 1891.]

not the same force in the case of wool. The mule is employed in a modified form, and has proved a most valuable machine for certain yarns, while the ring frame is also very widely adopted.

A very great part of the advance in this trade must be credited to the greatly improved methods of finishing the cloth. The machinery now in use for this purpose is the product of many inventors, and does its work in a manner leaving little to be desired. The dangers and diseases arising from wool sorting and opening have been greatly reduced, although it is, unfortunately, the case that more than necessary suffering is often due to the adoption of imperfect methods and defective arrangements. It is to be hoped that by scientific arrangements and improved methods such suffering and disease may soon become a thing of the past.

The figures exhibiting the modern development of the trade need not be intricate. Going only back to 1860, the consumption of wool in the United Kingdom was about 250,000,000 lb. By 1885 this had risen to about 370,000,000 lb. If the figures relating to employment are considered, they appear equally striking. Fifty years before 1885 there were employed in wool manufactures of Great Britain about 80,000 persons, while in the latter year the number so employed was about 265,000.[1] In the two years thus contrasted the power-looms in use in the trade in woollen and worsted fabric amounted to nearly 5,000 in 1835, and about 140,000 in 1885.

[1] The total number of persons—men, women, and children—employed in the textile trades in the census years is given as follows in the Fiscal Blue Book (Cd. 1761, pp. 363–364), published in 1903, and embodying the results of the inquiry into our fiscal system in consequence of Mr. Chamberlain's advocacy of tariff reform:—

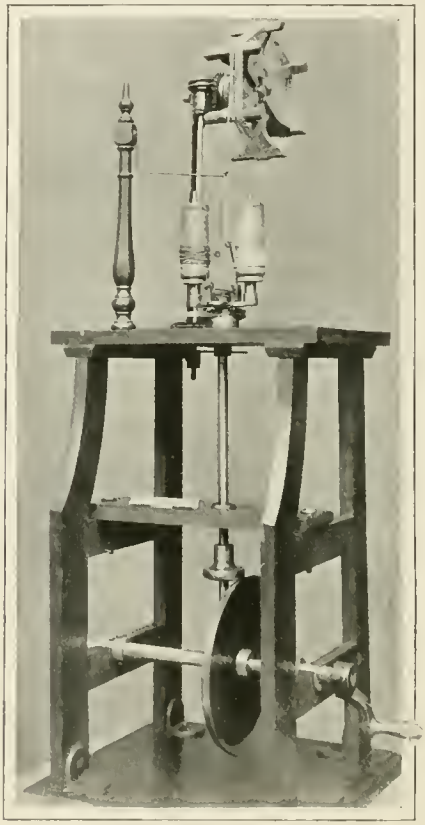
| | Cotton. | Lace. | Woollen and Worsted. | Linen. | Silk. |
|---|---|---|---|---|---|
| 1861 .. | 492,156 .. | 54,617 | 230,029 .. | 22,718 . | 116,320 |
| 1871 .. | 508,715 .. | 49,370 .. | 246,645 .. | 18,680 .. | 82,963 |
| 1881 .. | 551,746 .. | 44,114 .. | 240,006 .. | 12,871 .. | 64,835 |
| 1891 .. | 605,755 .. | 34,948 .. | 258,356 .. | 8,531 .. | 52,027 |
| 1901 .. | 582,119 .. | 36,439 .. | 236,105 .. | 4,956 .. | 39,035 |

In the cotton and woollen trades the decline between 1891 and 1901 appears to be chiefly due to the increased saving of labour by machinery, as the cotton used does not show a corresponding decline, and the wool increases (*ibid.* p. 367, *seq.*).

| | Cotton. (million cwt.) | Wool. (million lb.) |
|---|---|---|
| Estimated quantity used 1891 .. .. | 1·49 .. .. | 487 |
| ,, ,, ,, 1901 .. .. | 1·47 .. .. | 541]. |

Silk.

It is unfortunately the fact that the silk trade of this country has not shown the expansion marking the other textile industries. To whatever reason this may be due, it is, surely, a matter for



SILK-THROWING MACHINE.
*(Victoria and Albert Museum.)*

regret. There seems to be no doubt that fashion runs more to fabrics produced by French looms, and that the Continental manufacturers have really attained better results from their trading than have been reached in England. There also seems to be much reason to believe that better art education and more perfect technical training may place this country abreast of its Continental rivals. At the same time, it must be admitted that

the backward condition of the silk trade in Great Britain is partly due to the very success of the other textile industries attracting energy and capital which would otherwise have tended to develop the manufacture.

W. E. BEAR. Agriculture.

Rinderpest, which had made its first appearance in 1865 (p. 488), was raging throughout the United Kingdom in 1866. The Royal Commission appointed to consider the subject reported in May, and the "stamping-out" policy was recommended. This was adopted, and before the end of 1867 the disease was exterminated. At the same time pleuro-pneumonia and foot-and-mouth disease, which had been prevalent and unchecked—the former since 1840, and the latter since 1839—were nearly got rid of for a time by the cattle-plague regulations. In 1869 an Act was passed in relation to all the principal infectious diseases of farm stock regulating imports to some extent; but it was many years before sufficiently stringent measures were passed to rid the country of foot-and-mouth disease and pleuro-pneumonia. Cattle plague again visited the country in 1872, and a third time in 1877; but on both occasions the prudent regulations adopted suppressed the malady in a few months. At the opening of the period now under review there was a partial recovery in the prices of corn, wheat in 1866 averaging 49s. 11d. a quarter, barley 37s. 5d., and oats 24s. 7d. A somewhat deficient harvest, and war on the continent of Europe, conduced to this recovery, which made the prices of wheat and barley about 8s. higher than they were in the preceding year. A very bad harvest in 1867 sent wheat up to 64s. 5d. a quarter, barley to 40s., and oats to 26s.; but after 1868, which was one of the best corn years ever known, prices were lower again, an excellent harvest being gathered in 1870. The Franco-German War sent prices up in the latter part of 1870 and in 1871, and for the four years ending with 1874 wheat was nearer 60s. than 50s. a quarter. From this time, except for a recovery in 1877, due to the Russo-Turkish War, the prices of corn, and of wheat especially, were lower than they had been except on very rare occasions in the times of Protection. Up to 1874 the period of prosperity referred to in a preceding section may be said to have prevailed, with only one considerable interruption. Meat, wool, and dairy produce, as

well as corn, sold well as a rule, the animal products having kept up in price when corn declined temporarily in value.

Foreign Competition.

By this time foreign competition had begun to tell somewhat severely. Previous to the cereal year 1873–4, the net imports of wheat (including flour) had only once been as much as ten million quarters: but in that year they were over twelve millions, and with some fluctuations they continued to advance. Imports of other kinds of corn together also increased greatly; the total of 1874 being nearly 50 per cent. greater than that of 1866, while a few years later it was 100 per cent. greater than it had been in the 'sixties. No serious advance in the receipts of foreign live stock took place until after 1874; but the total quantity of dead meat of all kinds, never much over 1,000,000 cwt. in the 'sixties, was over 3,500,000 cwt. in 1874, rising steadily till it approached 7,000,000 cwt. in 1879, and reached the maximum for the period under review in 1880, when it was 7,566,681 cwt. After that year there was a decline, not fully recovered till after 1885. Imports of butter and cheese, too, began to increase considerably in 1873, and both were doubled between 1866 and 1885. During the same period the imports of wool were doubled, and the price was reduced 60 per cent. These statements will partially explain the decline in agricultural prosperity which set in after 1874. It is necessary to explain, however, that as live stock imports did not increase out of proportion to the demands of consumers, and much of the dead meat was such as was consumed almost exclusively by people who could not afford to buy home produce, the price of British meat kept up well until nearly the end of the period; also, that the receipts of foreign butter were not in excess of the demands of a growing population, so that prices were maintained at a fairly high level. Indeed, it was not till 1885 that the values of meat and butter showed a decline from the average prices of a long series of preceding years. Cheese dropped in price after 1874, but only once to a decidedly low level before 1885.

Agricultural Depression.

From the preceding remarks it will be understood that, so far as the depression, which began mildly in 1875 and afterwards became severe, was due to low prices, it was, up to 1884, mainly the prices of corn and wool which were accountable. But there was a series of bad seasons in the 'seventies, the yield of wheat having been below the average in seven

years out of the ten. The acute stage was reached in 1879, known as the "black year," when the harvest was the worst of any in the second half of the century, if not in the whole of it. The yield of wheat was estimated at only 15½ bushels an acre, or not much over half an average, and other corn was correspondingly deficient. Moreover, the grain was half spoilt by a wet harvest. Instead of advancing, prices fell, in consequence of heavy imports. America had a great crop, and shipped to us a much greater quantity of wheat than in any previous year. Altogether in 1879–80 we imported in wheat and flour the equivalent of nearly 16,500,000 quarters of wheat, or 2,000,000 more than we had ever before received in twelve months. In 1879, too, our markets were glutted with American cheese, which brought the value down to a price low beyond record for one season. Again, a disastrous attack of sheep-rot carried off large numbers of animals, while pleuro-pneumonia and foot-and-mouth disease caused further losses. Thus all classes of agriculturists suffered severely, and thousands of farmers were nearly ruined. Rents, which had been constantly rising since 1855, had reached their maximum, and many tenants were unable to pay their landlords, some of whom granted temporary remissions. The annual value of "lands" (including tithes) had risen from £41,117,626 in England and £5,872,714 in Scotland in 1855–6 to £51,798,950 in the former country and £7,769,303 in the latter for 1879–80. For Great Britain the advance was over £12,500,000 sterling, or nearly 27 per cent. As the depression lasted, rents, though not at first commonly, fell. In too many cases they were kept up, only temporary remissions being allowed in specially bad years, until many old tenants were ruined, and then necessarily reduced to new tenants; while in some cases, where leases were current, no reduction at all was made. But, when convinced that the depression was permanent, the great majority of landlords met their tenants fairly, and the annual value of agricultural land in Great Britain, including tithes, fell from £59,568,253 in 1879–80 to £53,314,144 in 1884–5. Out of this decline of about £6,250,000 sterling, less than half a million was due to reductions of rent in Scotland. The decline did not end with the period under notice, but has gone on until the present time. As indicated

by the figures just given, depression was much less severely felt in Scotland than in England, the farmers of the former country being less dependent upon corn for their livelihood than those of the latter, and scarcely at all upon wheat. This remark also applies to Ireland. For many years, too, the grazing and dairying districts of England suffered comparatively little: but all classes of farmers in all parts of the kingdom shared to some extent in the disaster sooner or later.

Its Results.

A full account of the changes produced by the depression in agriculture would carry us far beyond the period under notice. The most remarkable are the decrease in the area of land under corn—wheat especially, and the increase in the acreage of pasture. Up to 1859 the area of wheat in the United Kingdom had not fallen below 4,000,000 acres, and in 1874 it was still as much as 3,821,655 acres. After that season, however, there was an almost constant decline, the extent of land under wheat having fallen to 2,549,335 acres by 1885, to fall 1,000,000 acres more in the next decade.[1] Between 1866 and 1885 all corn crops together fell off in area by 1,444,641 acres. In the same time the area of permanent pasture in the kingdom had been extended by nearly 5,000,000 acres, as closely as can be ascertained. The Irish statistics of the earlier year did not distinguish between permanent and temporary pasture; but in the two together, including clover, there was an increase of about 6,000,000 acres in the United Kingdom, half being derived from an addition to the total cultivated area. In the same period, again, cattle increased from 8,569,693 to 10,868,760; but it is doubtful whether sheep or pigs had increased or diminished. The year 1866 was the first in which the Agricultural Returns were collected, and they were far from perfect.

The Rural Exodus.

The decrease of arable land and the poverty of the farmers greatly reduced the number of persons employed on the land, and the migration of people from the rural districts to the towns became excessive. Some time before depression commenced, the employment of women and children in agriculture had been steadily falling off. The women gave up

[1] In 1900 the wheat acreage was 1,901,038. That of all corn crops together had declined since 1885 by 1,307,023 acres. Cattle numbered 11,455,009.]

the work when their husbands earned enough to do without their help as wage-earners, and school regulations interfered with the employment of young children. Between 1871 and 1881 the number of males of all ages employed on the land in England and Wales in various capacities fell from 1,200,920 to 1,137,810, showing a decrease of 63,110, or 5·3 per cent.; but about half the decrease consisted of boys under fifteen years of age. A much greater decrease of labourers over

THE BAD SEASON, 1879.

(*Reproduced by special permission of the Proprietors of "Punch."*)

fifteen took place after 1881: in the next decade the decrease was 82,499, or 7·7 per cent.[1] In Scotland also there was a decrease, but not as great in proportion. There was no fall in the rates of wages up to 1885.

So long as farming paid fairly, the improvement in agriculture, which had been active for many years up to 1865, continued its progress, and it was not till after 1879 that any noticeable check took place. But as the resources of landlords

[1 In 1901 there was a considerable further decrease. The total number of persons employed in agriculture in England and Wales in 1891 was 1,099,592, in 1901, 988,340. The number of women employed, however, increased considerably in the decade.]

and tenants became reduced, economy in expenditure upon the land was inevitable. Such expensive work as land-draining was almost entirely given up, and a large area of land formerly yielding good crops of corn reverted to its early condition of rough pasture, not a little having been left to "lay itself down" with indigenous grasses and weeds.

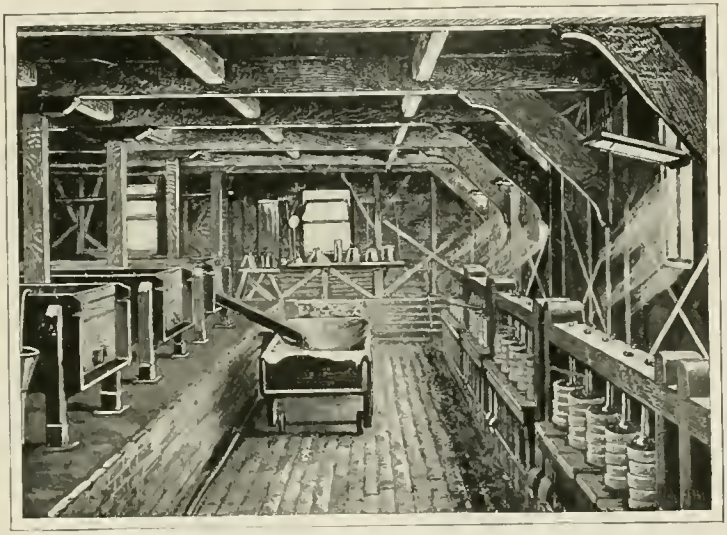
Dairying.

There never was a time in the history of British agriculture in which so much progress was made in the dairy industry as during the period under notice and subsequently. Shortly after it began, Mr. H. M. Jenkins, Mr. J. C. Morton, Dr. Voelcker, Mr. (afterwards Professor) Sheldon, and a few others, made successful efforts to create an interest in the improvement of dairying, especially by describing the advances made in certain foreign countries; and at about the same time, or later, Professor Long, Lord Vernon, and Dr. Bond, in England, and Canon Bagot and Professor Carroll, in Ireland (to name only a few out of many), became active advocates of a movement in favour of the application of science in dairy practice. One result was the formation, in 1866, of the British Dairy Farmers' Association, which has done a great deal, by holding shows and conferences, and by establishing a Dairy Institute at Aylesbury, to improve the industry which it represents. The Bath and West of England Society some time afterwards started a travelling dairy school, and the example was followed by other bodies. The great multiplication of dairy schools, however, was reserved for a later period. Professor Sheldon, assisted by authorities in several countries, brought out his great work, "Dairy Farming," shortly after the first Dairy Show of 1877 was held, and that book did much to enlighten the backward dairy farmers of the United Kingdom. At that time the use of a thermometer in an English farm dairy was a great rarity. Butter was churned into a lump and made up by hand, as a rule, and was seldom twice alike in quality from the same dairy. A great improvement has since taken place, helped in no small degree by the enterprise of makers of dairy utensils, implements, and other appliances, some of which will be mentioned in connection with agricultural implements. The first cheese factory in England was established in 1871. A few others were afterwards started, but the system did not find much

favour. Butter factories, or creameries as they are usually termed, were of later introduction, and they too have multiplied but slowly, except in Ireland, where they became somewhat numerous after the end of the period with which this section is concerned.[1]

Of the course of improvement in agricultural implements and machinery during the period under review only a general notice can be attempted. With respect to steam cultivation, it

**Implements and Machines.**



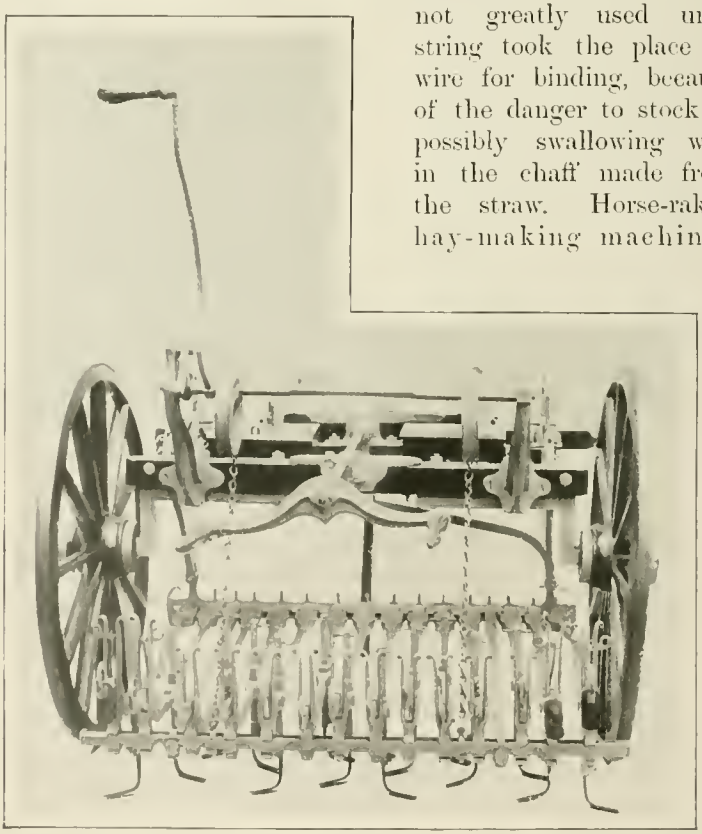
THE LONGFORD CHEESE FACTORY, DERBYSHIRE.

(*Professor Sheldon: "Dairy Farming,"* 1881.)

will suffice to state that early in the period Fowler's double-engine ploughing and cultivating system came into use, and subsequently held its ground, with improvements, against all rivals. Towards the end of the period, or a little later, Darby's steam digger was introduced, and other similar implements followed it. By 1869, when the Manchester field trials were held, no fewer than 84 reaping-machines were selected by the judges for testing, and as many as 52 competed, including those of

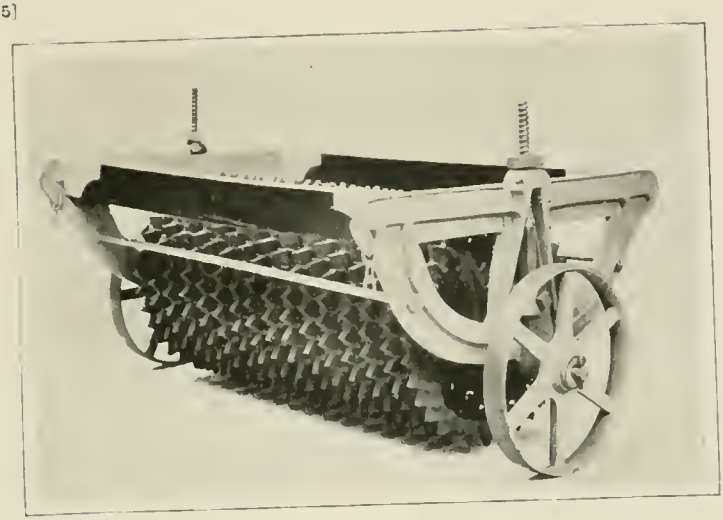
[1 Their development was afterwards encouraged by an unofficial body called the "Recess Committee" (1895), presided over by Mr. (now Sir) Horace Plunkett, M.P., whence was developed the Irish Board of Agriculture and Technical Education.]

delivery in sheaf bundles (not tied), swath delivery, one-horse manual delivery, and two-horse manual delivery machines. The winners of prizes in the several classes were Hornsby, Samuelson, Bamlett, Burgess and Key, and Cuthbert, and others were commended. The mowing-machines tried numbered 23, Hornsby, W. A. Wood, Burgess and Key, and Samuelson (for a combined mower and reaper) being the winners. About 1870, the self-binding reaper was brought out in the United States by McCormick, Wood, and others, wire first and string or straw afterwards being used for binding the sheaves. This wonderful labour-saving machine was shortly afterwards introduced to this country, but was not greatly used until string took the place of wire for binding, because of the danger to stock of possibly swallowing wire in the chaff made from the straw. Horse-rakes, hay-making machines,



MODEL OF A LEVER HORSE-HOE IN 1851.

(*Victoria and Albert Museum, by permission of Messrs. R. Garrett & Sons.*)



CLOD CRUSHER, 1845.

*(Victoria and Albert Museum, by permission of Messrs. R. Garrett & Sons.)*

drills, thrashing-machines, straw-elevators, traction and stationary engines, ploughs, harrows, and all other kinds of implements and machines were also greatly improved. In 1877, the centrifugal cream-separator, a machine which has revolutionised dairying, was invented by Lefeldt; but it was only the embryo of the separator as improved, and indeed transformed, by Laval and other makers. At about the same time the butter-worker was introduced in this country. Many other new and improved dairy implements and utensils were brought into use later on, including wonderfully improved churns, butter-driers, milk-testers, refrigerators, heaters, and cheese-making apparatus.

**Science and Education.**

A number of elementary books on science in relation to agriculture, which it is not necessary to specify, came out during the period, and Lawes and Gilbert continued to publish records of their valuable and diversified experiments at Rothamsted (p. 483). Field experiments were commenced by the Royal Agricultural Society on a trial farm at Woburn, granted by the Duke of Bedford in 1877, and feeding experiments followed. As to educational establishments, a grant was given by the Government in 1868 to the Chair of Agriculture at the University of Edinburgh. In

1869, the Senior Examinations of the Royal Agricultural Society were started, leading to the teaching of agriculture in some of the middle-class schools. In 1874, the Aspatria Agricultural School was founded in order "to carry out with greater efficiency the improved ideas of practical and scientific farming." In the following year, the Science and Art Department added the Principles of Agriculture to the subjects for which grants were made to elementary schools, and afterwards provided courses of lectures on the subject, mainly for teachers in those schools. The Downton College of Agriculture, a private venture, was established in 1880 by Professor Wrightson, assisted by Professor Fream. A much greater multiplication of agricultural schools and classes was reserved for a later period.

Legislation.

Space is not available for tracing the history of agricultural legislation. It may be mentioned, however, that a permissive Agricultural Holdings Act, providing for compensation for tenants' improvements, was passed in 1875, and proved abortive; and that a second Act, under the same name, was passed in 1883, which did more good indirectly than directly (pp. 528, 537). As long ago as 1848 Mr. Pusey endeavoured to get some such measure through the House of Commons, but in vain. In Ireland some important measures, securing to tenants their improvements, and enabling them to purchase their holdings on easy terms, were passed (pp. 523, 884), though the latter arrangement was not made extensively operative until 1891 and, still further, in 1903.

Agricultural depression was only in its childhood in 1885, and although our period ended with rents and prices falling, and gloomy prospects for the owners and occupiers of the soil, fate had in store for them many years of trials more severe than any which, up to that time, they had been called upon to endure.

J. E. SYMES. The Economic Conditions.

THE prosperity which marked the closing years of the period dealt with in the last chapter was interrupted by the failure of Overend, Gurney and Co., and of other firms, in the spring of 1866. The panic of that year bore a general resemblance to those of 1847 and 1857, already described (pp. 489, 497).

In each case the crisis was due to over-speculation, and the sinking of vast sums of money in enterprises that would never pay, or only begin to pay after the lapse of years. The firms that had been too reckless in advancing money for such schemes were, in 1866, the first to suffer. The Joint Stock Discount Company failed in February; Barnard's Bank in March. Then began a rapid contraction of credit, and a drain of gold from the Bank of England. The directors tried to check this by raising the rate of discount to seven per cent. (May 3rd), to eight per cent. (May 8th), and then to nine per cent. (May 9th). Meanwhile the Mid-Wales Railway Company had failed, and among their creditors was the great firm, Overend, Gurney and Co. The Court of Common Pleas decided on May 9th that a railway company had no right to incur debts in the way in which not only the Mid-Wales, but many other railway companies, had incurred them towards this same firm. On the following day Overend, Gurney and Co. stopped payment, with liabilities exceeding £10,000,000. This was the greatest failure that had ever taken place in the City. The panic that followed was of unparalleled intensity, but the Government once more suspended the Bank Act. The directors raised their rate to ten per cent., and began lending vigorously to individuals and firms that could offer good security. £12,225,000 was thus advanced in eight days, and, although there were many failures and heavy losses, the panic very soon subsided. Once more the air was cleared by the storm. Weak and rotten firms had been swept away; but strong ones held their ground, and credit soon revived. So far the events of 1866 followed a somewhat similar course to those of 1847 and 1857. There are, however, two exceptional features to be noticed. Hitherto the crises had taken place at intervals of rather more than ten years. In this case the interval was less than nine years. The speedier recurrence was probably largely due to the increased facilities for joint-stock trading (pp. 498, 556), and the consequent encouragement to over-speculation and undue giving of credit. A more interesting fact is that the panic of 1866 is the last really extensive panic that England has had. Since then there have, of course, been periods of failure and commercial disaster, but there has been nothing corresponding

to the great decennial panics of 1826 to 1866, which at one time seemed to be almost inevitable incidents of the complicated modern mechanism of trade and finance, largely based upon credit. This happy cessation of panics is largely to be attributed to increased knowledge and prudence, though it is also probable that the fall of prices from about 1873 has greatly tended to check the excessive speculation which invariably precedes one of these great panics.[1]

**Friendly Societies.**

From 1867 the material prosperity of England increased by leaps and bounds, and in particular the condition of the working classes steadily improved. Not only were they earning better wages, but they were steadily building up their own organisations, by means of which the hardships of their lot were mitigated. This will be a convenient place to refer to the growth of the friendly societies, both in this period and in earlier times. Friendly societies may be defined as the Mutual Assurance Societies of the Poor, and in many respects they overlap trade unions, so far as the latter are also benefit societies. Some important distinctions must, however, be noted. A friendly society is hardly ever limited to the members of a single trade. It has nothing to do with strikes. It cannot, as a rule, give "out-of-work" benefit, since it has no means of determining whether a member is out of work through his own fault. It generally makes some provision for social entertainment, and frequently for religious services. Some of the existing friendly societies date back to the very beginning of the eighteenth century, and an Act of 1793 seems to imply that many such societies were then in existence. The Act sought to encourage them, especially by exempting members from removal under the old Poor Law. This seems to have greatly stimulated the movement. Within a few years, in Middlesex alone, more than a thousand societies were enrolled. The "goodfellowship" element was prominent in most of these. The scale of payment usually under-estimated the risks; and though in many cases members abstained from claiming benefits to

[1] A great panic, however, was nearly brought about in 1890 by the failure of Messrs. Baring Brothers & Co., consequent on a political and economic crisis in Argentina, and was only averted by the steps taken by the London banks, on the initiative of the Governor of the Bank of England, Mr. Lidderdale, to guarantee payment of the liabilities of the firm, before the failure became known.]

which they were entitled, most of the societies had to be wound up. The Act of 1819 tried to remedy this by requiring rules and tables to be submitted to justices, who were to consult two actuaries or other competent advisers before authorising a society. The Act, however, was so badly administered that there was very little improvement till 1829, when Mr. J. Tidd Pratt was appointed as an official to whom all societies must submit their rules. His authority was slight, but he did much by moral influence to get sound principles adopted. A series of further Acts in 1834, 1846, 1850, and 1855 modified their legal status. The last of these was the most lenient, and under it 21,875 societies were formed. A Royal Commission, which sat from 1870 to 1874, published very full information on the subject. It was found that the largest societies consisted of a number of almost independent branches, affiliated to a central body. Thus, the Manchester Unity had in 1878 526,802 members, and funds amounting to £4,325,000. The Ancient Order of Foresters had 521,416 members, and £2,497,000. The other kinds of friendly societies are divided by the Commissioners into twelve distinct classes. Some are confined to particular counties, some to particular towns, some to women, and some to particular trades. Some divide their balance every year, and start afresh; some combine the functions of a savings bank with other friendly society objects. The most successful with the poorest and most ignorant classes were the collecting societies, so called because the subscriptions were called for by agents. In many of these a very undue share of the contributions found its way into the pockets of the officials. Yet the system made way among those who were too lazy or unintelligent to join the other kinds of societies. The Commissioners found two hundred and fifty-nine of these "collecting societies" with over two million members, and funds amounting to nearly £700,000. The Act of 1875 was founded on the report of the Commission, and extended the means of ascertaining and remedying fraud or mismanagement. Every society was obliged to send to the Registrar an annual balance-sheet, and also a quinquennial return of its assets, liabilities, sickness, and mortality. A reasonable proportion of the members were to have power to insist on a general meeting, or an official inspection, and

the Registrar might insist on the dissolution of a society. There were also various provisions to check abuses in "collecting societies," and in relation to infant insurance. These last need further extension, but with all their defects the societies have conferred immense benefits on the working classes, who have built them up by their own energy.

Co-operation.

The principles of the co-operative stores (p. 495) continued to be very successfully applied. Stores increased greatly, both in numbers and size. They ceased to be mere local ventures. They began to hold annual congresses. Moreover, the co-operators successfully extended their functions from retail to wholesale transactions. The following figures show the rapid progress of the Co-operative Wholesale:—

| Year. | Business. | Profits. |
|---|---|---|
| 1865 ... ... | £120,755 ... ... | £1,859 |
| 1870 ... ... | £653,608 ... ... | £6,818 |
| 1875 ... ... | £2,103,226 ... ... | £23,816 |
| 1880 ... ... | £3,339,681 ... ... | £42,000 |
| 1885 ... ... | £4,793,151 ... ... | £77,630 |
| [1902 ... ... | £18,397,559 ... ... | £336,369] |

Meanwhile the number of co-operative societies had grown to 1,441, containing 850,659 members, and doing business to the amount of £31,305,910; but the success of the movement continued to be mainly confined to the distributive department. The societies that undertook productive work, such as manufacturing, continued to be comparatively few and small, and only moderately successful, except some few, which were indeed called co-operative, but where the principle of dividing profits among employees as such hardly existed, or did not exist at all.

Trade Unions.

From about 1863 the number of strikes and lock-outs, and the formation of employers' associations to fight the trade unions, had called much attention to the trade disputes. Apprehension was increased by an outrage at Sheffield (June, 1866).[1] It was vainly pointed out that the connection of any trade union with the outrage was not proved, and that

[1 The Sheffield outrages, planned and paid for by one Broadhead, the secretary of the Saw-Grinders' Union, were revealed by him and other participants to the Special Commission of 1867, under an indemnity. They had no connection with the general body of Trade Unionists.]

in any case the whole movement could not be regarded as responsible.

Even the Courts of Law seem to have been influenced by the general feeling. At any rate they now decided that trade unions were so far "in restraint of trade" as to be practically illegal associations, which the law would not protect from fraud on the part of their own officials. This was a serious matter. Positivists like Frederic Harrison, Henry Crompton, and E. S. Beesly, and Christian Socialists like Thomas Hughes exerted themselves to remove the prejudices of their own class. A Royal Commission was appointed, but the case of the unions proved so strong that its report was on the whole rather in their favour. The Commission advised that legal protection should be extended to those societies that did not insist upon certain restrictions (such as limitation of apprentices, prohibition of piece-payment, etc.). The minority maintained that nothing done by a *workman* ought to be illegal, unless it would also be illegal for other persons to act in a similar way, and that nothing done by a *society* should be illegal unless it would also be illegal if done by an individual. The Reform Act of 1867 gave the franchise to a large number of trade unionists, and their opponents did not attempt any restrictive legislation. In 1869 Messrs. A. J. Mundella and Thomas Hughes introduced a Bill representing the trade union views. This was withdrawn on an undertaking from the Government to deal with the subject speedily, and meanwhile to pass a provisional measure for the protection of trade union funds.

**Labour Legislation of 1871.**

This was actually done, but the Act of 1871 was accompanied by a Criminal Law Amendment Act, which affixed severe penalties to intimidation and coercion, without in any way defining these words. The unionists and their friends knew that much in their policy was coercive, and might even be said to be intimidatory, even though they considered it reasonable, and thought that it should be legal. The Liberal Government refused, however, to go further, and many trade unionists revenged themselves by abstention from the polls, or by running Labour candidates at the General Election of 1874. This policy was successful. The new Conservative Parliament repealed the Criminal Law Amendment Act of 1871, and expressly declared peaceful picketing to be permissible (1875 and 1876). (Cf. p. 830.)

Federation.

Meanwhile the growth of the Miners' and of the Cotton Operatives' federations had been so remarkable as to practically make the North of England the headquarters of trade unionism. The chief part in the building up of the Miners' National Union was taken by Alexander Macdonald, a Scottish pit-boy, who attended Glasgow University in the intervals of his work. The Union was effectively established by the year 1863. Macdonald and his colleague, Thomas Burt, were elected to Parliament as the first two "Labour" members in 1874. The great Cotton Operatives' Organisation devoted itself chiefly to the shortening of the hours of labour and to the drawing up of elaborate "lists"—detailed remuneration tables of every process, and piece-work in their complicated industry. These two great federations and the Society of Amalgamated Engineers were pursuing, on the whole, a peaceful policy, developing the "benefit" side of trade unionism and organising the workers, but using their influence against strikes, except in extreme cases. This line tended to alienate some of the more active spirits, and in 1871 the public were surprised by a great strike, in which unionists and non-unionists combined. This was the five months' strike of men engaged in the engineering trades at Newcastle for a "Nine Hours Day." It was conducted so judiciously that even the *Times* supported the men. Funds poured in from all parts of the country, and ultimately the employers accepted fifty-four hours a week as the recognised time limit.

Strike of 1871.

Prosperity, 1872-74

This victory, combined with the changed state of public opinion, and the good trade of the years 1872, 1873, and 1874, led to a great increase in both the number and the strength of unions. The agricultural labourers, instigated by Joseph Arch and others, formed extensive unions. The old societies prospered and multiplied. In days of rapidly rising prices the unionists were disposed to accept the employers' principle that "wages should follow prices." Hopes were widely entertained that by means of boards of conciliation, sliding scales, division of profits, and such devices, the long war between capital and labour would be brought to an end: and even when, in 1874, there was a general contraction of demand, especially in the great coal and iron industries, the men at first peaceably submitted to serious reductions in their wages. But things went from bad to worse. The employers demanded more and more

Depression, 1875-1880.

*Photo: Bassano, Old Bond St., W.*

THE RT. HON. A. J. MUNDELLA, M.P.

*Photo: Braconnier, Clerkenwell Close, E.C.*

J. M. LUDLOW.

*Photo: Braconnier, Clerkenwell Close, E.C.*

THOMAS HUGHES, M.P.

*Photo: Bassano, Old Bond St., W.*

HENRY FAWCETT, M.P.

SOME SYMPATHISERS WITH LABOUR.

reductions of wages and longer hours of work. The high hopes of 1874 were shattered. Strike followed upon strike; but the men were in almost every case defeated. In the three years 1878, 1879, and 1880 the Amalgamated Engineers paid out £287,596 in "out-of-work" relief. The Agricultural Unions, and hundreds of small societies, ceased to exist; and in 1881 the number of members of unions represented at the annual Congress had sunk to one-third of what it had been in 1874.

**The New Unionism.**

It was natural that the depressed trade of 1875–80 should lead to wide difference of opinion among workmen as to the wisdom and adequacy of the policy hitherto pursued by the unions. The movement known as the "New Unionism" was the outcome of some of these divergences: and although it mainly belongs to the years subsequent to 1885, its beginnings were plainly discernible by the close of our period. Broadly speaking, the chief distinctions between the old and the new unionism are, firstly, that the "old" was mainly individualistic. It said to the State, "Hands off. Leave us freedom to combine and to make use of the peaceful pressure of public or class opinion. Only protect our property and our rights to freedom of contract, and we ask nothing more from you." The New Unionists, on the other hand, were frankly Socialistic. They wanted to obtain an eight-hour day by legislation, and municipal organisation of workshops. They looked forward to the nationalisation of land, and even of the instruments of production. Again, the old unions aimed mainly at a policy of peace. Only a small proportion, probably less than an eighth part, of their funds went to support strikes, and since their legal position has been secured they have steadily denounced violence. The new unionists, on the contrary, looked upon trade unions as essentially fighting machines. They formed societies in which no provision was made for superannuation, sickness, or funerals, and they showed some tendency to apologise for violence and for intimidation. The fact that they tried to raise the condition of a poorer and more oppressed class will partly explain the difference. The old trade unionism has been called "the aristocracy of labour." The new movement tried to organise and elevate the unskilled labourers, the sweated, and all the other victims of modern industrialism.

*Photo: London Trades Council.*

GEORGE ODGER.

*Photo: Lock & Whitfield, Regent St., W.*

ALEXANDER MACDONALD, M.P.

*Photo: Pitt & Son, Bethnal Green Road.*

GEORGE HOWELL, M.P.

*Photo: The London Stereoscopic Co.*

THOMAS BURT, M.P.

SOME LABOUR LEADERS.

Labour Disputes.

Little space can be spared here to describe the attempts that have been made to mitigate the evils of the conflicts between employers and employed by schemes of arbitration and conciliation. The first moderately successful Board of Conciliation was started in the Nottingham hosiery trade as early as the year 1860. Others were soon afterwards founded in the lace, iron, coal, and other industries. They undoubtedly prevented many conflicts, and brought about a better mutual understanding between the two parties, whose interests are in some respects identical and in some respects opposed. Arbitration, again, has often been resorted to with advantage, and the historian of the future may be able to record that some combination of the two methods has reduced industrial warfare to a *minimum*. The highest authority on the subject wrote, in 1875:

"Industrial conciliation is an economical success. This is a mere truism, so far as the putting a stop to strikes or lock-outs is concerned. Industry, instead of being subject to constant interruptions, is continuous. The waste and the misery consequent on stoppage, even for a short time, are avoided."

But the hopes of 1875 were damped by the experience of the following years, or at least were relegated to the future. The same must be said of the various schemes of sliding scales and profit-sharing, which are, indeed, only forms of conciliation.

Labour Laws, 1874–1878.

We turn now to speak of various statutes passed between the years 1874 and 1880, which directly affected the interests of the labouring classes, but which we have not yet had occasion to speak of. These laws may conveniently be divided into two classes: (1) those which directly affected the conditions of labour, such as the Factory Act of 1874, the Merchant Shipping Act of 1876, and the Employers' Liability Act of 1880; and (2) those which affected the life of the working classes, and, therefore, *indirectly* their labour, such as the Dwellings Act of 1875, the Alkali Act of 1874, and the Pollution of Rivers Act of 1876. We will deal with these briefly in the above order.

Factory Act, 1874.

An Act of 1874 still further reduced the hours of labour for women and children in factories, and thereby indirectly brought the labour of many adult males down to the same *maximum*, viz. fifty-six hours a week. In support of this Bill it was contended with much force that the growing complexity of machinery and

other changes were adding to the strain on factory workers. On the other side there were the usual prophecies about foreign competition. The Bill happened to be passed just towards the end of a period of exceptional good trade; and the contraction of 1875 and the following years might have been plausibly used as a proof that the prophecies of 1874 were being fulfilled. It is a striking proof of the triumph of the more Socialistic view, that

*Photo: Russell, Baker St., W.*
SAMUEL PLIMSOLL, M.P.

even in the worst time there was no perceptible reaction against the Factory Laws. It was rightly felt that they strengthened rather than weakened us in the world's rivalry.

**Merchant Shipping Act, 1876.**

The Merchant Shipping Act of 1876 was less fortunate. It attempted to deal with very real evils. The overloading of ships and the sending them to sea in bad repair had roused great indignation, and Mr. Plimsoll's efforts induced the Government to interfere. By the Act of 1876 every owner was required to mark the load-line on his vessel, and the Board of Trade was to have extended powers and duties of supervision. It seems doubtful, however, whether the Bill did any good. Load-lines were marked so as to allow unreasonable loads, and this tempted

captains, in foreign ports, to load up to the line. The other provisions of the Bill tended to shift responsibility from owners on to the Board of Trade; and it seems that the evils both of overloading and of unseaworthiness were aggravated by this well-meant attempt to check them.

Employers' Liability Act, 1880.

The Employers' Liability Act of 1880 made employers liable in cases of accident when they had not been guilty of any personal negligence. It sufficed to prove negligence in any one to whom the employer had delegated his authority.

Other Laws.

A few further instances of the tendency of legislation to extend the sphere of State action may be here introduced. The Artisans' Dwellings Act of 1875 aimed at empowering ratepayers to provide better dwellings for the working classes. This Act was so hedged in with precautions that little came of it. The whole risk and expense was to fall on the rates. Owners were to be compensated at market price, and this was to be largely based on the income hitherto derived from dwellings so bad as to call for demolition. In other words, the cost would be prohibitive. The Alkali Act of 1874 and the Pollution of Rivers Act of 1876 may be included in the same group. The former aimed at restricting the injuries to health and vegetation caused by alkali works. It took the form of testing smoke and laying down a *maximum* proportion of muriatic acid that should be tolerated. The pollution of rivers was more difficult to deal with, because there was less agreement among experts as to the tests that should be applied.

Socialism.

While Parliament was thus tentatively extending the sphere of State action, an agitation in favour of a more thorough Socialism was beginning. Since the decline of Chartism and the development of commerce and industry under the Free Trade policy, English Radicalism had been mainly individualistic. The prominent trade union demand had been for liberty to combine without State interference. The popular agitation for an extension of the suffrage, *e.g.* in 1886, had been singularly free from indications that the poor meant to use political power (when they got it) to improve directly their material condition, except by insisting on economy and a peaceful foreign policy, and a freedom from vexatious interferences. Disestablishment was advocated, not so much because it might provide funds to be used for national objects, as because it would do away with a form

of inequality and of State interference. In these days much of the moral and intellectual fervour of artisan leaders was absorbed in the "Bible smashing" of the Secularist lecturers; and of these lecturers, Bradlaugh in particular was strongly opposed to Socialism. The results of Free Trade seemed a convincing argument of the evils of State interference, and the commercial prosperity made men hope that poverty was going to be got rid of (so far as was humanly possible) by liberty. Presently the tide turned. The prosperity of 1867 to 1874 had been largely stimulated by the amount of gold poured into Europe from California and Australia. Now the mines were becoming less productive, and suddenly a great demand for gold set in, chiefly through the policy of the German and American Governments. Germany substituted a gold for a silver standard (1873). The United States contracted their paper currency. Other Governments began to fear that they would be denuded of gold, and modified their currency or mint systems. Naturally gold became appreciated, and the fall of prices set in. This in turn led to a fall in profits and discouraged employers from extending their business. Wages fell, and, what was even more serious, the amount of employment (even at reduced wages) contracted. All this tended naturally to call forth bitter cries from the poor, and warm sympathy from the benevolent, and many of both sorts were attracted to Socialistic schemes.

Henry George.

The appearance of Henry George's "Progress and Poverty" marks the transition of Radicalism to Socialism. George (a Californian) was, in theory, a strong individualist, a champion of the rights of capital no less than of labour. The great success of his book was undoubtedly partly due to its appearing at a time when there was an unusually strong predisposition to accept the bold paradox that what is usually called progress brings with it an increase of extreme poverty. His proposed remedy was one which fitted in well with the teaching of some of the dominant political economies.

Land Nationalisation.

But of those who at first accepted the doctrine many soon advanced to a Socialistic position. The attack on land-owning passed into an attack on monopolies, and thence to an attack on the virtual monopolies which the possession of capital creates. Socialistic organisations and Socialistic newspapers

began to multiply. The Secularist societies practically turned Socialistic in spite of the efforts of Bradlaugh. Meanwhile the two political parties began to seek the Socialist vote. Free Education was established in 1887; and proposals for a legislative limitation of labour to eight hours a day, for old age pensions subsidised or wholly provided by the State, for a reform of the Poor Law in the direction of greater leniency and greater generosity, began to be advocated by people who would repudiate the charge of being Socialistic. Another side of the same tendency was seen in the extension of municipal functions. Large towns began to take over the gas and water supply, and to work the same for the advantage of their populations. Free libraries, parks, museums, baths, and other institutions supported out of the rates began to multiply. In some cases the trams were taken over by the municipality. In Nottingham, a University College was started out of the gas profits; and almost everywhere the ratepayers showed a readiness to vote rates for educational purposes, far beyond what the authors of the Act of 1870 had contemplated or desired. It would be beyond the scope of this book to discuss the policy which has thus been gaining ground; but no reasonable account of the history of the period dealt with in this chapter can ignore the fact that it brought in a strong movement in a Socialistic direction on the part of Parliament and of the local authorities, as well as in the thought and literature, and in the popular demands. It is satisfactory to note that the popular agitation has been singularly free from violence in comparison with the earlier agitations of the century for the People's Charter or for Parliamentary Reform.

Municipal Socialism.

Population.

During the period 1865–85 the population continued to increase, but the *rate* began to fall off from about the year 1878. The census figures are (for England and Wales):—

| Year. | Population. | Increase per cent. |
|---|---|---|
| 1871 ... ... | 22,712,266 ... ... | — |
| 1881 ... ... | 25,974,439 ... ... | 14·3 |
| 1891 ... ... | 29,002,525 ... ... | 11·6 |
| [1901 ... ... | 32,526,075 ... ... | 12·1] |

The birth rate per thousand rose pretty steadily till 1877, when it began to fall. By 1885 it stood at 33·3, which is lower than it had been since 1853. The death rate also fell, but

1335]

not quite so fast. The Emigration rate (English) reached a *minimum* in 1887, when the emigrants were 63,711; and a *maximum* in 1883, when they were 183,236.

The fluctuations in the national wealth are less easy to trace, but they probably corresponded pretty closely with those of the population. In other words, England grew in wealth from 1865 to 1885, but the *rate* of increase probably diminished Wealth.

UNIVERSITY COLLEGE, NOTTINGHAM.

after 1875. Our foreign trade fluctuated considerably, but a general upward tendency may be clearly seen by grouping quinquennial periods.[1] By 1885 a decline was seen. The fall in almost all prices since 1875 must, of course, be kept in mind. The

[1 The figures to 1902 are as follow (the later ones being taken from the "Fiscal Blue Book," c. 1761, 1903; the earlier from a return of 1896):—

Annual Average (in million pounds).

| Groups of Years. | Imports. | Exports. | Re-exports. |
|---|---|---|---|
| 1865–9 | 285 | 181 | 48 |
| 1870–4 | 346 | 230 | 55 |
| 1875–9 | 375 | 201 | 56 |
| 1880–4 | 408 | 234 | 64 |
| 1885–9 | 379 | 226 | 61 |
| 1890–4 | 419 | 234 | 62 |
| 1895–9 | 453 | 238 | 60 |
| 1902 | 528 | 277 | 66] |

opening of the Suez Canal, and various improvements in steam engines, and inventions for economising fuel, led to an astounding development of shipping business (pp. 464, 748). This helped to cheapen raw material and food. The better organisation of labour, the growing economies from production on a large scale, and the immense accumulation of capital (with the consequent fall in the rate of interest) acted in the same direction. On the other hand, the bad harvests of 1876, 1877, 1878, and 1879, and the Protective Tariffs of foreign and colonial governments, checked the growing prosperity; and the fall of prices and of the rate of profit caused considerable depression. The classes who suffered most from this were (1) the owners of agricultural land; (2) the smaller employers, including most of the farmers: (3) those who were displaced by new processes, and especially the more elderly members of the working classes, who could not adapt themselves to the changes that were going on, or who did not possess the efficiency which modern conditions of labour required. The success of trade unions in maintaining a *minimum* wage (in each trade for each locality) operated hardly on those whose labour was not worth this *minimum*, and the conflicts between employers and employed caused grave distress.

Progress.

Nevertheless, the wealth of England, and of the working classes in particular, greatly increased between 1865 and 1885. The gross annual value of the property and profits assessed to the income tax rose from 395 millions in 1865 to 571 millions in 1875, and to 631 millions in 1885,[1] and the statistics of consumption, especially of the consumption per head of meat, tea, sugar, tobacco, and other comforts of the working classes, prove that these, on the whole, advanced greatly in material prosperity. The progress of Friendly Societies, Trade Unions,[2] Co-operative Stores, Savings Bank Deposits, Building Societies, etc., gives additional evidence that the power and will to save have increased side by side with the increased consumption of comforts and luxuries.

At the beginning of the nineteenth century, when the evils of the Poor Law system were under discussion, the general condition

[1 In 1900 it was 788 millions.] [2 Since this was written the position of Trade Unions has been weakened by the decisions affecting picketing in *Lyons* v. *Wilkins* (1896), *Quinn* v. *Leatham* (1901), and the Taff Vale case (1902).]

of the poor received an unprecedented amount of attention. During the eighteenth century the primary education of the poor had been left to the zeal of voluntary workers, prompted by religious, charitable, and other motives. But it was beyond dispute that a large proportion of the population was entirely without the means of education, and that England was behind many foreign countries in recognising the educational duty of the State. The first effort to establish the principle as accepted abroad had been made by Whitbread in 1807, in a Bill which proposed to create parochial schools through the agency of local vestries empowered to draw on the rates. The Bill was thrown out in the Lords, who failed to see what a severe check such a scheme might have given to the Dissenters, who were exerting themselves strenuously to secure as large an influence as possible through elementary schools. While the pupil-teacher or monitorial system which Bell had introduced was being adopted in the schools where Church of England doctrine was taught, the Quaker Lancaster was using a very similar plan for teaching large classes in the Borough Road. In 1808 some leading Dissenters took over Lancaster's school and founded the Royal Lancastrian Institution, which became in 1814 the British and Foreign School Society. In their schools, which were intended for children of all religious persuasions, the Bible was read, but no catechism was taught. To counteract the results expected from this institution, the Church of England was compelled to organise a rival society, and in 1811 the National Society for Promoting the Education of the Poor in the Principles of the Established Church began its work, and in 1817 was incorporated by royal charter.

MARY BATESON. Education in England, 1807-1885.

Primary Education.

Bell and Lancaster.

In 1816 Brougham's Commission sat to inquire into the state of the education of the lower orders in London, but the evidence taken concerned chiefly the abuse of charitable endowments. In 1818 its inquiry was made to extend to the whole country, and it continued to sit for many years. There were shown to be 19,326 infant and day schools of all kinds, attended by 605,704 pupils of all classes; whereas it was estimated that the number of children requiring elementary teaching was over two millions. To remedy the defective supply Brougham brought forward a Bill in 1820, in which he proposed a local rate, placing local control in the

First Commission.

hands of the magistrates of Quarter Sessions. Still further to conciliate the Churchmen, he suggested that all teachers must be members of the Church of England; to conciliate Dissenters he suggested that parents should be free to withdraw their children at the hours when the catechism or liturgy was taught. The Bill was rejected, as being equally displeasing to both parties.

The educational needs of the country were first recognised

*Photo: Walker & Cockerell.*

JOSEPH LANCASTER, BY JOHN HAZLITT.
*(National Portrait Gallery.)*

First Grant.

by the State when, in 1833, a Government grant was made to the National and the British Schools. Nearly all the primary schools then belonged to one of the two societies, but the connection was purely formal. There was no real union, no common superintendence, no direction, no code of regulations, no uniform standard of teaching. The numbers under daily instruction were now stated to be 1,276,947 children. But in contrasting these figures with the statistics of a later time, it must be remembered that all classes of schools, for children of all ages, for rich and poor alike, were included in the estimate, and the census, which was never complete,

was only roughly calculated. The number of children receiving some sort of elementary education in the first half of the century cannot be ascertained.

Although the increase in numbers appeared to augur well, it was generally acknowledged that of the scholars thus accounted for, many were included who merely left home to be taken charge of by some decrepit person, incapable of either physical or mental activity. The distribution of schools was wholly irregular: so that while in some parts of the country

MADRAS COLLEGE, ST. ANDREWS.

there was even an excess of provision from charitable endowment, in many of the large manufacturing towns of recent growth there were no endowed elementary schools at all, sometimes not even a dame-school. Religious differences, however, made it impossible that any adequate remedy should be accepted; all that was done was to continue for six years the grant which was administered by the Treasury. Doctrinal hostilities had been instrumental in bringing the educational problem within the sphere of practical politics, but they served no less effectually to prevent a solution of the problem. Select Committees sat almost annually without arriving at any conclusions. But in 1839 the control of the grant was, by an Order in Council, taken away from the Treasury and vested in a Committee of the Privy Council, and two further proposals

Proposals of 1839.

were made which excited violent opposition. The Committee of Council determined to make inspection a condition of their grants, and further projected the creation of a normal school for teachers, with schools for practice in teaching attached to the same. In the training-school the members of each religious communion were to be taught their own religious dogma. This proposal to put the denominations on a footing of equality in a normal school, which it was believed would be the pattern for all normal schools, enabled the Church party to carry a motion through the House of Lords which was lost by two votes in the Commons—a motion to rescind the Order in Council. This action was rebuked in a Royal reply, but the scheme for a State training-school had to be abandoned, and the religious societies were left to form their own. The Dissenters had already established one in the Borough Road. The first Church training-school was planned by Dr. Kay, secretary to the Committee of Council, who, aided by Mr. Tufnell and Robert Eden, Vicar of Battersea, had started a school for teachers in Battersea, where it was at first intended to train workhouse boys only. In 1842 this school got a grant from the Committee, and was handed over to the National Society to become a normal school for the training of adult teachers.

The monitorial system came to be generally regarded as a failure, and an improved pupil-teacher system was established in 1846, on the model then used in Dutch schools. The best of the former monitors and other promising children aged over thirteen years were kept on at small salaries, and bound over by indenture to serve an apprenticeship of five years. Teachers were to be encouraged by gratuities to instruct the apprentices, and scholarships were offered to them at the training-schools. The salaries of teachers also were raised and made in a measure dependent on the annual report, and further a pension for old age was provided. A new departure was made in the requirement that all schools which were to receive grants should be well furnished and provided with books and apparatus.

A unanimous resolution of the Commons that more education, moral and religious, was a necessity for the working classes—a resolution which showed that all were

A DAME'S SCHOOL, BY THOMAS WEBSTER, R.A.

*(National Gallery of British Art.)*

united as to the end in view, differing only as to the means —resulted in an increased Parliamentary grant, and the Committee of Council worked steadily on without legislative interference.

In 1858 the Duke of Newcastle's Commission began to inquire into the merits and defects of the existing system, and it fell to Mr. Lowe (afterwards Lord Sherbrooke) as Vice- **Commission of 1858.**

A VILLAGE SCHOOL IN 1840, BY HABLÔT K. BROWNE.
(*"Master Humphrey's Clock," by Charles Dickens.*)

President of the Committee of Council, the officer who in 1856 had been made responsible to the Commons, to take steps to amend the state of affairs described by the Commission.

In 1861 he first proposed that the grant should be a capitation grant, a principle which had been in part accepted for rural districts in 1853, and extended to towns in 1856. The grant was to depend almost entirely on the number of scholars who should pass an examination in reading, writing, and arithmetic. The scheme was ultimately modified, and in 1862 it was agreed that one-third of the grant should be awarded on attendance, two-thirds on examination. This is the **The Revised Code.**

basis of the system subsequently known as "payment by results."[1] At this time, too, the "standards" or classes still in use were established, and the old classification by age was given up. The steady diminution in the Government grant that followed in 1861–5 showed that many of the schools which had hitherto received it were unworthy to do so. The proposer of the Bill obtained the result he sought: for if elementary teaching was still inefficient, it was at least cheaper. One drawback, however, was quickly discovered. The code was found to encourage teachers to give an undue amount of time to the three standard subjects, and statistics were worked out to show that a child under the Revised Code spent 2,920 hours in learning to read. To amend this, an arrangement was made in 1867 by which the higher subjects were allowed a certain measure of encouragement in the form of grant.

In 1869 it was estimated that the accommodation in inspected schools could supply places for 2,000,000 children, or nearly double the number provided for in 1859. The average attendance had also doubled; still the accommodation was only half of what was required, the attendance only a quarter of what it should have been.

The Act of 1870.

In 1870 Mr. Forster's Elementary Education Act was passed to remedy the deficiency in the supply of efficient elementary schools. The country was mapped out into school districts, coinciding generally with the boundaries of boroughs or parishes; and on the complaint of the inspectors of returns that the school accommodation in any district was insufficient, a School Board was to be formed, elected by ratepayers in a parish, or burgesses in a borough. There were two saving clauses: first that the complaint could be challenged by ten ratepayers or the school-managers, when fresh inquiry would be made; and, secondly, six months' grace was given, during which the want might be voluntarily supplied. It was made possible to remit school fees on account of poverty, and where the poverty of the inhabitants of a particular district required them, free schools were to be established.

The religious difficulty was met by requiring that in all public elementary schools, whether Board or Voluntary schools,

[1] Its last remnant, individual examination, was abolished in 1893.]

attendance at religious worship or instruction should not be made a condition of admission: if the parent chose to withdraw his child he was free to do so, and, further, any religious observance or instruction must be at the beginning or end of school hours. In Board schools the Act requires that no religious formulary distinctive of any denomination shall be taught, and that parents shall be free to withdraw their children from religious observance at the beginning or end of school hours. All public elementary schools are to be open to inspection at all times, but the teaching in religious knowledge is not to be examined. The aid to Voluntary schools was limited by the rule that the grant in any year should not exceed the income of the school derived from voluntary contributions, fees, or other sources during that year. This rule was changed in 1876, when it was ordered that no reduction of grant should be made on this ground unless the grant exceeded 17s. 6d. a head. The Act of 1870 used only tentative measures to secure the attendance of children. School Boards were empowered, but not compelled, to pass bye-laws fixing the standard of exemption, and it was left to the magistrates to deal with the offenders as they thought fit. In 1876 the principle of compulsion was extended; the duty of the parent to have his children educated in the "three R's" was formally propounded, and a minimum requirement was fixed which the bye-law, if accepted, must enforce. Where there was no School Board, school-attendance committees might enforce bye-laws. In 1880 the acceptance of bye-laws was made compulsory on all school districts.

**The Religious Difficulty.**

Public education has been assisted in Great Britain by steadily increasing Government grants. Thus:—

| | |
|---|---|
| 1833-39 ... ... ... ... | £20,000 |
| 1839-41 ... ... ... ... | 30,000 |
| 1842-44 ... ... ... ... | 40,000 |
| 1851 ... ... ... ... ... | 150,000 |
| 1879-80 ... ... ... .. | 2,854,000 |
| 1884-85 ... ... ... ... | 4,410,000 |
| 1893-94 ... ... ... ... | 8,409,000 |
| [1902-03 ... ... ... .. | 10,851,000] |

The growth of the system described above in outline can be most easily set forth by a table:—

| Year. | Number of Primary Schools in *Great Britain*. | Annual Grant to the same (000 omitted). | Number of Inspected Schools *England and Wales*. | Number of Voluntary Schools *England and Wales*. | Number of Children on their Register (000 omitted). | Number of Board Schools. | Number of Children on their Register (000 omitted). | Number of Teachers Certificated. | Accommodation per cent. of Population. | Attendance per cent. of Population. | Subscription (£000 omitted). | Rate (£000 omitted). | Grant (£000 omitted). | Average Attendance (000 omitted). | Cost per child. £ s. d. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1851 | 3,825 | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 1855 | 4,800 | — | 3,853 | — | — | — | — | 2,481 | — | — | — | — | — | — | — |
| 1860 | 7,270 | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 1861 | — | 813 | 5,438 | — | — | — | — | 7,072 | 8·75 | 5·5 | — | — | — | — | — |
| 1865 | — | — | — | — | — | — | — | — | — | — | 311 | — | 378 | 848 | 1 5 5 |
| 1870 | 10,919 | 840 | 8,281 | — | — | — | — | 12,467 | — | — | 419 | — | 563 | 1,152 | — |
| 1871 | — | — | — | 9,772 | — | 82 | — | — | — | — | — | — | — | — | — |
| 1872 | — | — | 9,854 | — | — | — | — | — | — | — | 193 | 5 | 790 | 1,336 | 1 7 5 |
| 1875 | — | — | — | — | — | — | — | — | — | — | 676 | 236 | 1,158 | 1,837 | — |
| 1877 | 18,118 | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 1879 | — | 2,732 | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 1880 | 20,670 | 2,851 | 18,289 | — | — | — | — | — | — | — | 739 | 726 | 2,130 | 2,751 | — |
| 1882 | — | 3,101 | — | 14,421 | — | 3,868 | — | — | — | — | 725 | 808 | 2,393 | 3,015 | 1 16 8½ |
| 1885 | 21,976 | 3,664 | 18,895 | 14,600 | 2,859 | 4,295 | 1,553 | 40,706 | 18·18 | 12·26 | 756 | 1,110 | 2,867 | 3,371 | 2 0 6½ |
| [1900 | 23,204 | 4,911 | 20,100 | 11,359 | 3,054 | 5,758 | 2,361 | 61,038 | 20·28 | 14·53 | 811 | 2,959 | 10,048 | 4,666 | 2 11 7] |

Boys and girls leaving elementary schools half taught, before the period closes, could in many places continue their education by means of evening classes. The University Extension Lectures, too, since 1873, in all populous districts had begun to bring educational opportunities within the reach of the working classes. The popular desire for greater intellectual advantages has been shown in the large towns throughout the period. The Mechanics' Institutes in Manchester, Liverpool, Sheffield, Coventry; the Birkbeck Institute (1823), the Polytechnics, are among the older institutions founded to satisfy these needs, and since 1854 working men's colleges, and since 1860 working men's clubs, have shown that the movement is real and lasting. Cheap popular literature found a market early in the period. The Society for the Promotion of Useful Knowledge began its work in 1825, and soon after there poured forth Family Libraries, Libraries of Entertaining Knowledge, penny magazines, and cheap encyclopædias, which needed no charitable society to support them, and the cheap issues of English and foreign classics followed in the way thus prepared. Free Libraries, since the Acts of 1845 and 1850, have supplied many large towns with the means of every form of literary enjoyment.

As early as 1835 the educational methods pursued at the

# THE EDUCATION PROBLEM.

MASTER FORSTER. "PLEASE, M'M, I 'VE DONE IT, M'M!"

SCHOOLMISTRESS (BRITANNIA). "AND *HOW* HAVE YOU DONE IT, WILLIAM?"

MASTER FORSTER. "PLEASE, M'M, I 'VE REDUCED ALL THE FRACTIONS TO THE LOWEST COMMON DENOMINATION."

SCHOOLMISTRESS. "GOOD BOY! *GO UP!*" [*The Good Boy enters the Cabinet.*

THE ELEMENTARY EDUCATION ACT, 1870.

(*Reproduced by special permission of the Proprietors of "Punch."*)

Boys' Secondary Schools.

great public schools for boys were widely censured by popular opinion. At Eton the number of school hours was said to be only eleven a week, and there were complaints of the tyranny exercised by the elder scholars, of the constant assembling of too many boys in one hall, of the unequal treatment of the rich and noble, of the excessive exercise of

*Photo: Rodger, St. Andrews.*

DR. ANDREW BELL.

*(From an old engraving.)*

memory, the few subjects taught, and the antiquated methods used. The education was almost exclusively classical, and it was contended that even Greek and Latin were ill taught, with bad grammars and by means of mere fragments of the great writers. The greater part of the boys' time was spent in the composition of Greek and Latin verse. At Charterhouse Bell's "Madras system" was in use, and the elder boys were set to teach classes in the Lower School, after

the fashion of the monitors in the National Schools. The education at Westminster, according to Sydney Smith, cost his son from £150 to £200 a year. He writes that the first year there is severe, "an intense system of tyranny, of which the English are very fond, and think it fits a boy for the world—but the world, bad as it is, has nothing half so bad."

Brougham's inquiry into the abuse of charitable endow-

SCHOOL ROOM, WESTMINSTER SCHOOL, 1883.
(*By permission, from a drawing by H. M. Marshall.*)

ments was long in bearing fruit, but in 1840 an Act for improving the condition of grammar schools was passed which declared that whereas there were many foundations for teaching boys wholly or principally in grammar, and whereas the term "grammar" had been construed by the Courts to have reference only to Greek and Latin, the Courts of Equity were to be empowered to remodel such schools. According to the Charity Commissioners' report of 1842, there were 705 grammar schools and 2,200 other non-classical schools. But no steps were taken as yet towards ascertaining what kind of teaching was given in these schools. In 1861 a Royal Commission was appointed to inquire into the conditions of nine

of the chief endowed schools—namely, Eton, Winchester, Westminster, Charterhouse, Harrow, Rugby, Shrewsbury, St. Paul's, and the Merchant Taylors' School. The result of this, the Clarendon Commission, was the Public Schools Act, 1868, which reformed the administration of the first seven, arranging particularly for the admission on favourable terms of a larger number of day scholars. The Commission of 1864 discussed next those schools not hitherto included. It was ascertained that there were nearly 800 endowed schools, 80 proprietary, and over 10,000 private schools. The report of the Commission filled twenty volumes. The principal result of this, Lord Taunton's Commission, was the Endowed Schools Act, 1869, from which sprang the Endowed Schools Commission, with power to deal with charitable trusts "in such manner as may render any educational endowments most conducive to the advancement of the education of boys and girls, and either of them." In 1874 the Commission was merged into the Board of Charity Commissioners.

**The Endowed Schools Commission.**

At the close of the period there were already many signs of the growth of public interest in questions of educational theory and practice, which in the past the English have, as a rule, neglected, leaving them to be dealt with on the Continent or in the United States. The change is probably partly due to the great increase of sympathy with children and childhood that is characteristic of the present day.

**Girls' Schools.**

In the first half of the century girls of the richer classes were sent almost exclusively to boarding-schools, or were taught by private governesses whose educational merits could not be tested by any examinations. The school-books were Mrs. Mangnall's "Questions," Pinnock's "Catechisms," Mrs. Marcet's "Conversations," Keith's "Use of the Globes," Mrs. Trimmer's "English History," and other elegant abridgements. The one intellectual faculty that was trained in girls was verbal memory, and for them knowledge existed only in epitome. While boys read the classics, girls learnt lists of the names of gods and goddesses; they were expected to be familiar with all the great names of ancient and modern history, but with the names alone. A few were suffered to reach the classics through Valpy's translations and Hamilton's keys. Even those domestic interests which have at times been

credited with educational powers were now neglected, and it was considered discreditable that a lady should subject herself to what little of mental discipline may be derived from cooking or making caps. She was at as much pains to conceal household occupations as she was to avoid all signs of blue-stockingism.

Royal Commission of 1864.

The subject of girls' education was first seriously handled by the Royal Commission of 1864. It was shown that the number of girls' schools was very large, while the number of pupils in each averaged only twenty-five. There was no system of classes or of examinations, no definite course of studies; each pupil learned such accomplishments and at such times as her parents thought fit. The best education for the female mind was believed to be steady application to vocal and instrumental music and to the subject of ladylike manners and deportment. For what were technically known as "accomplishments" expensive schools had expensive masters, whilst the teaching that was educational was in the hands of one or two teachers, who had neither separate classes nor separate rooms.

Instead of gymnastics or games, instruments of torture were used for modelling the figure. A contemporary writer says that "could the modern schoolroom (1831) be preserved, it would pass for a refined Inquisition. There would be found stocks for the fingers [the cheiroplast] and pulleys for the neck with weights attached." Fanny Kemble, to whom Nature had been by no means unkindly, was found wanting in deportment; and she writes that she wore a "back-board made of steel, covered with red morocco, which consisted of a flat piece placed on my back, and strapped down to my waist with a belt, and secured at the top by two epaulettes strapped over my shoulders. From the middle of this there rose a steel rod or spine with a steel collar, which encircled my throat, fastened behind." The machine proved a failure, and she was put under the tuition of a drill-sergeant, who did for her all that was required.

Teachers.

There were no means of testing the competence of the women who entered the teaching profession, and as the position of teachers in boarding schools and of governesses in private families was, as a rule, unenviable, this profession was too often the refuge of the destitute. A change, however, was at hand.

About the middle of the century a few of the more intellectual among the governesses studied at the Literary Institutes and the London Institution, and in 1848 some professors of King's College, London, gave lectures to the Governesses' Benevolent Society, which, under F. D. Maurice's care, developed into Queen's College. In 1849 Bedford College was founded, chiefly through the influence of Mrs. Reid and some intellectual

THE GYMNASIUM, NORTH LONDON COLLEGIATE SCHOOL FOR GIRLS.
(*By permission of the Head Mistress.*)

Unitarians. In 1854 Cheltenham College, the first proprietary girls' school, was opened, and not long afterwards Miss Buss's private school (which eventually became the North London Collegiate School for Girls) was well established. After the Commission of 1864 had dealt with the question of girls' education, and proposed the restoration of some endowments to girls' schools which had been alienated from them, the Women's National Educational Union was founded, largely through the agency of Mrs. William Grey, and in 1872 this Union became the Girls' Public Day Schools Company. The tendency in the secondary education of girls, since these

changes took place, has been, on the whole, to approximate their education to that of boys.

**Higher Education of Women.**

The admission of women to University teaching and examination followed close upon the change in secondary education, and in their origin and subsequent history the two movements are closely connected. In 1867 women were admitted to examinations in the University of London. Two years later the first scheme for a collegiate institution with academic teaching took shape, and in 1872 it was incorporated as Girton College, Cambridge. In the following year members of this college were first informally admitted to Tripos examinations. In 1871, after the University of Cambridge had opened the Higher Local Examinations, to stimulate the education of women aged over eighteen, Miss Clough opened a house for students in Cambridge, which in 1875 became Newnham Hall, afterwards Newnham College. In 1881 the same University formally admitted women, who have resided the statutory terms and satisfied prescribed conditions, to the Tripos examinations, and in 1884 somewhat similar privileges were given at Oxford. The opportunities thus afforded have been seized, with results that serve year by year to establish what once was strongly contested, that mental cultivation is desirable for women as for men.

**London University.**

The exclusion of Dissenters from matriculation at Oxford and from degrees at Cambridge led to the proposed creation of a London University, in 1826, which two years later took shape as London University College. Crabb Robinson writes that he has bought a hundred-pound share in this Gower Street Company, as it was called by the scoffers, for it was a private enterprise; but he thought the share worthless and took it only as "a debt to the cause of civil and religious liberty." The Church party, in alarm lest Londoners should be taught exclusively by schismatics, opened King's College in 1831. In 1834 University College applied to the Crown for power to grant degrees, those in theology alone excepted. The Universities of Oxford and Cambridge and the College of Surgeons agitated in opposition, and for a time successfully. But in 1837 the University of London was incorporated as an examining and degree-giving body, while University and King's Colleges still continue as separate teaching bodies.

**Provincial Colleges and Universities.**

The first movement towards the creation of a provincial University was made by the Dean and Chapter of Durham, who obtained a charter, and opened their buildings in 1833. Victoria University received its charter in 1880, but its component colleges—the Owens College, Manchester, and the Yorkshire College, Leeds—had already been in existence for some time. Liverpool University College got its charter of incorporation in 1881. Birmingham, Bristol, Newcastle, Nottingham, Sheffield, had all established local colleges before the period closed.

**Oxford and Cambridge.**

The changes which have taken place at Oxford and Cambridge during the present century have tended, by the abolition of divers monopolies, to admit a greater number of persons to those benefits which the Universities bestow upon education; by the elaboration of a system of examinations, to provide tests of qualification; and by changes in internal administration, to increase the influence of the Universities upon education and learning. At the beginning of the century the excellence of a student's merits were tested at Cambridge only in one way, by the Mathematical Tripos; not till 1824 was the first Classical Tripos held, and to that examination until 1850 none were admitted who had not gained honours in the Mathematical Tripos. At Oxford there had been no examination for degrees till the beginning of the century, when classical and mathematical honours lists began. Until 1850 no other radical change was effected at either University. There had been an attempt in 1834 to secure for Dissenters admission to the degrees of Cambridge, but the Bill was thrown out in the Lords. In 1838 Whewell became professor of Moral Philosophy at Cambridge, and it was largely through his influence that a wider range of studies began to be regarded as proper to the University. As a consequence of this movement, two new triposes were held for the first time in 1851, in Natural Science and in Moral Philosophy, with Law and History. At Oxford, in 1850, there was a reorganisation of examinations, resulting in a system not different in essentials from that now established.

**Royal Commissions.**

These changes came from the Universities themselves, unassisted by pressure from without. Although at Cambridge Dean Peacock's "Observations on the Statutes of the University" had excited some enthusiasm, the need of a change in the constitution of the Universities was felt rather by the educated

classes as a whole than by the resident members of the Universities. It was generally thought that the number of persons admitted to share in the benefits of the Universities was unduly small ; and even at Cambridge, where there had been some increase in the number of students, the increase was not proportionate to the growth of the population. In 1850 a memorial was signed by some Oxford and Cambridge graduates and some members of the Royal Society, which set forth "that

*Photo Mason & Basebe, Cambridge.*

NEWNHAM COLLEGE, CAMBRIDGE.

the present system of the English Universities had not advanced, and was not calculated to advance the interests of religious and useful learning to an extent commensurate with the great resources and high position of those bodies," and pointed to the need of changes in their constitution. This was sent to the First Lord of the Treasury, and a Royal Commission was appointed to inquire into the state, discipline, studies and revenues of the University and Colleges of Oxford and Cambridge in 1852. At Oxford the inquiry was met with violent hostility ; it was pronounced illegal and unconstitutional, the Commissioners' letters were not answered, and Fellows were

told that they would violate their oaths taken on election if they provided materials for the inquiry. The Commissioners had to turn to the British Museum for copies of college statutes. Their verdict was that University teaching was nearly extinct, and that professorial lectures had suffered something more than what the friends of the existing system called "a temporary interruption." The Hebdomadal Board, with which rested the sole power of initiation in legis-

BALLIOL COLLEGE, OXFORD—SOUTH FRONT.

lative affairs, was described as "an organised torpor." It consisted of the heads of colleges and the proctors. Congregation, consisting of resident Masters of Arts, had merely formal functions and no power of debate; Convocation might debate only in Latin, which very few members could speak. By the Act of 1854 and subsequent ordinances the representation on the Hebdomadal Board of Professors and resident Masters of Arts was secured, Congregation was allowed to discuss questions of academic policy, the test oath was removed from matriculation and the B.A., but was kept for the M.A. degree; the opening of private halls was allowed, local preferences and other restrictions on competition for endowments were removed, but the restriction of Fellowships to clergymen was to be annulled only when three-fourths of the Fellows were found to be already in

orders. Oxford had hitherto been drawing about 300 students a year, of whom the larger number were destined for holy orders. Before long the matriculation doubled.

*Photo: Gillman & Co., Oxford.*

CHAPEL OF EXETER COLLEGE, OXFORD.

At Cambridge the chief suggestions of the Commissioners, embodied as the New Statutes, 1858, led to very similar changes. In ten years' time a fresh movement for reform was started. The "Essays on a Liberal Education" (1867) explained the views of the reforming party. Mark Pattison's "Suggestions on Academic Organisation" (1868) raised similar questions in

Oxford. In 1871 the Fellows of Trinity College, Cambridge, drafted of their own initiative a new code of statutes. In the next year a second Royal Commission was appointed to inquire into the revenues and property of both Universities. By the Universities of Oxford and Cambridge Act, 1877, two Executive Commissions were appointed to revise college statutes. In 1882 the work was finished: the principles involved in celibate, clerical, and lite fellowships were given up; the college system of teaching, by which each college provided, as far as possible, its own teachers, to the neglect of University and inter-collegiate teaching, was discouraged: the financial relations of colleges to the University were revised, so that the colleges were made to contribute to University funds. By these means, and by the admission of women students to college lectures and University examinations, the character of academic life was greatly changed within a short period. The creation of sectarian colleges (Keble, founded in 1870, being one of the largest) has opened new opportunities for the development of ecclesiastical influence.

ARTHUR GRIFFITHS. Prison Discipline, 1846-1885.

THE cessation of transportation, even in a modified form, imposed a serious obligation upon prison administrators (p. 316). In the early 'fifties they were faced with the necessity for finding an outlet for the convicts, hitherto so comfortably disposed of, now constantly accumulating on our hands at home. Hence the form of punishment known as penal servitude. Great public works were started and carried through. These are to be seen now, mostly completed, at Portland, in the breakwater and the vast fortifications on the Verne: at Portsmouth and Chatham, in the development of the dockyards and the large basins constructed there, capable of holding half our fleet: at Borstal, in the chain of forts protecting the Medway; at Dartmoor, where great areas of good land have been reclaimed from the barren wastes. The system first invented is practically that still in force. It is possibly irksome to all those who go through it, but the main idea of crime to be expiated cannot be forgotten: yet pains are taken that the moral and material well-being of the convict is not neglected.

Convict Labour.

QUADRANGLE, KEBLE COLLEGE, OXFORD.

NEW BUILDINGS, TRINITY COLLEGE, OXFORD.

(*Photos: Gillman & Co., Oxford.*)

The Modern Convict System.

The whole sentence is divided into three stages: of these the first is a period of probation, nine months, passed in separate confinement, at a time when the prisoner is supposed to be susceptible to better influences, and will be benefited by reflection and good counsels. The second stage takes him to the public works, where he is permitted to labour in association, but always under observation and control. All this time his industry is encouraged, his best energies secured by a judicious method of deferred reward, not in mere money—although he can earn a small fixed sum, to be paid on release—but in the boon a convict prizes most of all, release from durance. The marks gained for daily labour, if at the highest rate, secure remission of sentence, one-fourth of the whole term. But the premature release thus obtained is only conditional, and the convict issues forth with the clear understanding that he will be re-incarcerated if he falls into bad ways. This is the third and last stage—that of the license-holder, or ticket-of-leave man, whose character and conduct while at large are strictly watched, and freedom is only permitted pending good behaviour.

A system is best judged by its results, and that now in force can assuredly answer this test. Not only have the great works above mentioned been completed, and at considerable saving to the country, but there has in recent years been a marked diminution in crime. Not only have offenders *in esse* been wisely handled, but those *in posse* have been presumably deterred from taking to evil ways. There can be no question of this decrease. The population of the convict prisons has diminished steadily year after year, and whilst the number in 1875 was 9,815, in 1885 it had fallen to 8,836, and in 1895 to 3,309. It has been urged that this decrease is in a measure due to the greater leniency shown by all courts of jurisdiction, which often choose now to inflict a lesser penalty than penal servitude. If this were so the minor sentences should show a corresponding increase, and the smaller local prisons should be much more full. But here the same marked diminution is apparent. Where, in 1878, the lesser offenders in prison numbered 26,000, they are now barely 13,000, and this notwithstanding an increase in the general population of 4,000,000 during that period, which would in

itself excuse a corresponding increase in the criminal class. The same explanation is offered that the sentences are much shorter, and the prisons are in consequence more quickly cleared. But this is not sufficient to account for the whole decrease. Many other causes contribute, each different, but all issuing from the same general origin—a more humane and intelligent appreciation by the State of its duty towards those who lapse into or are predisposed towards crime.

Crime has been well defined as a failure to abide by or live up to a standard deemed essential by society. Criminals are such by accident or inclination, and under a perfect system of government they should be saved from the one and cured of the other. We do much nowadays in the first direction by our care of the youthful, by dealing with crime in embryo, and before it takes concrete form. Reformatories and industrial schools now cut off the supply of young recruits to the great army of criminals; wide-reaching machinery for child rescue is now in full operation, and is very effective while the general spread of education has undoubtedly contributed to the same end. But uniformity in prison discipline has been a potent factor, and has told upon the contingent floating continually in and out of prison. The convicted offender is certain that wherever he may find himself he will be under precisely the same rules, will eat the same scanty fare, do much the same labour. There is no distinction now between localities; the punishment is alike in all. No administrative reform in recent years has been more beneficial than the concentration of prison management under the central authority of the State. This was effected by the Prisons Act of 1877, when full powers were vested in a Board of Prison Commissioners. Great economy was the immediate result, for prisons were at once cut down in number from 114 to 56, with a corresponding saving on staff. Another obvious advantage in State control is the publicity afforded. Where the servants of the public are responsible there can be no secret abuses; everything must be carried on in the light of day, by officials who can be held strictly to account. The prisons of England can challenge the most searching investigation, and all who have compared them with the best

**Reform of 1877.**

in foreign countries must admit that ours are inferior to none.

Shortened Sentences.

Of English prison discipline and penal legislation the whole tendency is towards leniency, in dealing both with law-breakers and the ever-present but narrowing problems of crime. This is plainly shown in the determination of all courts to inflict light, even minimum, sentences; it is still more apparent in the many wise and humane modern enactments intended to keep all offenders possible from going to gaol. The Summary Jurisdiction Act was one of the chief of these; another was the First Offenders Act. Under the first named, where an alternative is offered of fine or imprisonment, time may be given to pay the money; before its passage non-production of cash meant immediate incarceration. The other Act, based as it is upon humanity and common-sense, saves all whose first lapse does not place them beyond hope of reform, from the indelible brand of the gaol-bird. The fewer people committed to prison the better for them and for the country. Equally true, on the other hand, is the proposition that all who, by repeatedly offending, offer themselves again and again for punishment should be retained within four walls until they can afford reasonable hope that they mean to go straight on release. These are the so-called habitual or professional criminals, and they constitute the greatest of unsolved difficulties in penal science. In some countries, as in the United States of America, a special penalty exists, known as the "indefinite" or "indeterminate" sentence, under which a persistent offender may be kept *sine die* in gaol. This punishment has been enforced to a limited extent beyond the Atlantic, and has, it is said, achieved considerable success. But it has been carried out there with an elaboration of costly means that rather condemns it as a practical method of dealing with a large number of offenders

MARY BATESON. Dress, 1840-1885.

THE period 1840–50 was one of the worst in the history of tight-lacing: all dresses pretending to fashion laced up the back, where the lady's maid could bring any amount of muscular force to bear upon the unfortunate victim. The crinoline, introduced in Paris in 1854, was welcomed as a way

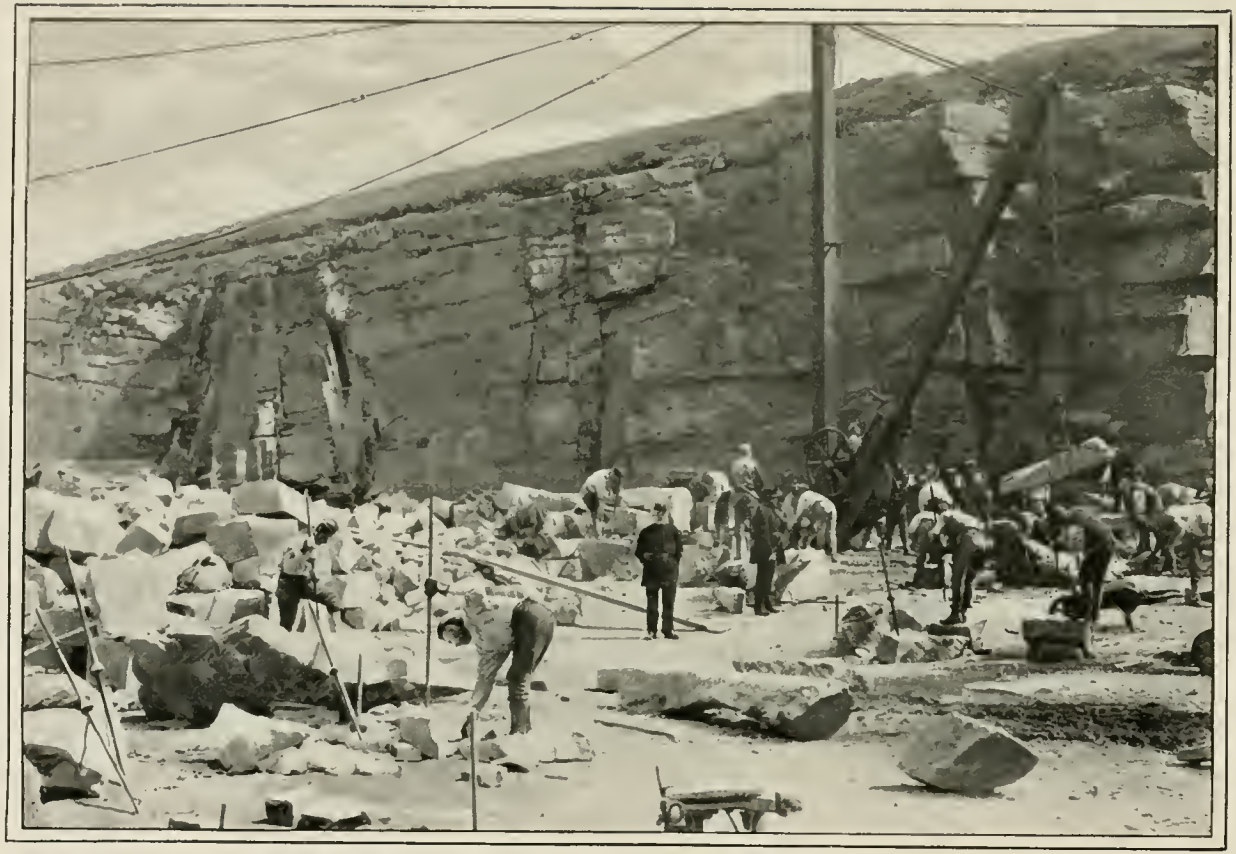


*Photo: Grove, Brompton Road, S.W.*

CONVICTS AT WORK IN THE DARTMOOR QUARRIES.

Crinoline.

out of the difficulty, for, as the advertisements announced, it made the dress appear sufficiently full and in proper contrast to the waist, "thereby sparing the necessity and agony, as well as injury, of tight-lacing." The term crinoline was applied to the stiff material of horse-hair used to distend skirts, and then to the ribbons of steel which took its place. To make a crinoline four narrow steels covered with tape were run into a calico slip or petticoat; the steel nearest the waist should be distant $1\frac{3}{4}$ nails from it, and should be $1\frac{3}{4}$ yards in

DRESS AND COIFFURE, 1845.
("World of Fashion," 1845.)

length. The other three steels should be $2\frac{1}{2}$ yards long, and at 6 nails distance from each other. The ends of only the top steel should meet in the front. Before this invention was made, and while skirts were merely stiffened or held out by a dozen or more petticoats, true gentility was best shown by the way in which the arms were drawn down to keep the voluminous mantle, Paisley or cashmere shawl, in its proper folds, while the hands, clasped in front, held a lace pocket-handkerchief or reticule. The shawl was fastened with a large cameo brooch. During the same period (1840–50), silk and satin aprons trimmed with lace or gnimp were worn indoors, as in the Queen Anne period.

In 1860 the skirt over the crinoline was trimmed with three deep flounces, scalloped and vandyked to break the size of the circle. A long loose jacket bodice was worn

Dress in 1860.
("*World of Fashion.*")

Dress in 1875.
("*World of Fashion.*")

DRESS IN 1860 AND IN 1875.

with sleeves made *en pagode*, wide at the cuff and set in low on the shoulder, where a muslin under-sleeve was attached which fitted tightly to the wrist. In 1864 there was a short rage for scarlet "Garibaldi bodies" held in by tight waist-belts. Boots to the ankle, white stockings, little round hats with a single pen-feather at the side, complete the costume.

DRESS AND THE LADY, 1856.
(*Reproduced by special permission of the Proprietors of "Punch."*)

The changes in the shape and size of bonnets were rapid; within the space of a few years there were velvet and beaver bonnets with lace curtains at the back, filled with lace quilling

**Headgear.** and artificial flowers under the brim which surrounded the face, the coal-scuttle bonnet, the bonnet of drawn white silk, the bonnet fitting close in front, and bonnets with long veils hanging from a string. While very large bonnets were worn, tiny fringed parasols were in fashion. The hair showed very little out of doors, and from 1840–50 the best effect was made by those who had well-shaped heads, with only a small quantity of straight hair. About 1836 the wicker-work plaits then in fashion, made of eight or nine strands plaited in an elaborate pattern, put nature to severe trial, but in 1840 ringlets over the ears and side-partings drove out the stiffer fashion. In 1846 came the smooth bandeaux plastered down with bandoline, and whereas in 1836 every girl had one artificial flower over the left ear in the evening, so in 1845 she wore

LADY IN SHAWL, 1853.
(*"World of Fashion."*)

a wreath. At the beginning of the crinoline period the hair was covered with a net spangled with jet beads, and at this

A THÉ DANSANTE, 1845.

(*Reproduced by special permission of the Proprietors of "Punch."*)

time wide flapping straw hats came in. In 1865 the Alexandra curl and the chignon were fashionable, necessitating much false hair, for the bonnet was worn tip-tilted at the back to display as much hair as possible.

In 1865–70 Dolly Varden dresses of gaily-flowered muslin were fashionable for summer wear; the bodice was pointed, and **Dress after 1885.**

EARLY VICTORIAN BONNETS.

("*World of Fashion*," 1845.)

the flowered polonaise was tucked up over a coloured skirt. The crinoline had gone, leaving only the bustle. In 1875 the alpaca skirts were trimmed with a quantity of small frills of kiltings

and tied tightly back across the knees, the polonaise being looped with bows and buckles. The dress was worn partially open at the neck, and the bell-sleeve exposed the lower part of the arm. This was the period when much jewellery was worn in the daytime, and when it was the fashion for all young married women to wear caps indoors. In the period of "Princess" robes, 1875–80, the skirt and bodice were cut in one piece, and made

A DOLLY VARDEN FAREWELL KISS, BY G. DU MAURIER.
(*Reproduced by special permission of the Proprietors of "Punch."*)

very plain. The skirt clung closely to the figure, and was made with a train. To the same period belongs the "fringe." From 1880 date the "æsthetic" and other "dress reform" movements, and from this time there are signs that fashion begins to rule over a smaller number of subjects, and fails to exercise such unchecked tyranny as in the periods which precede. The democratic movement seems in the matter of dress to have worked rather towards variety than towards uniformity.

**Men's Dress.**

In the time of the black satin stocks of 1840 men shaved their faces, and only cavalry wore moustachios. In the early 'forties whiskers began to be encouraged; but the beard and the

moustache (for civilians) only came in after military rules on the subject had been relaxed by the Crimean War. Soon afterwards the abundant locks which had been worn throughout the reign began to be cropped close in military fashion. In 1840 no white was worn round the neck other than a fold of white waistcoat, which showed above the coat collar and below the stock, but by 1855 white collars and bows had come in. French tall silk hats were made lighter and cheaper than the English beavers, and

AN IMPARTIAL STATEMENT IN BLACK AND WHITE, BY G. DU MAURIER, 1881.
(*Reproduced by special permission of the Proprietors of "Punch."*)

natural beaver was no longer used when new methods of waterproofing had been discovered. Ankle-jacks or jack-boots reaching to the ankle were characteristic of the same period. Already in 1825 Charles Macintosh had applied some important discoveries to the waterproofing of clothes (p. 514), and Hancock was able to induce the Guards to use his drab cambric waterproof capes on the way to field exercise. This colour began to take with the public generally, and all travellers by 1830 had macintoshes for coach travelling.

MARY BATESON. Social Life.

Writing in 1825, Sir Walter Scott says, "Drinking is not now the vice of the times," and again, to his son, he says, "The habit of drinking wine, so much practised when I was a young

man, occasioned many of my cruel stomach complaints. You had better drink a bottle of wine on any particular occasion than sit and soak and sipple at an English pint every day." "Sots are excluded from the best company." Habitual or violent drunkenness was already a social offence, but occasional total lapses and regular haziness after dinner were still weaknesses in men which all must tolerate.

Drink.

Gin-drinking among the lower classes had again reached alarming proportions in 1830. The numbers entering fourteen of the largest gin-shops in London were counted, and in one week the number of men was 142,453, of women 108,593, of children 18,391. Throughout the war, malt, hops and beer had been heavily taxed, and the consumption had not increased in proportion to the consumption of spirits, or even of tea and coffee. It was hoped that if the sale of beer were encouraged the sale of spirits might still further diminish, and in this belief the taxes on beer, hops, and malt were reduced, and cheap beer licences were sold at two guineas each. In the first year 31,000 of the new licences were taken out for "Tom and Jerry shops." Already in 1834 it was seen that some revision of the system was needed, and new licences, more costly for the sale of beer to be consumed on than off the premises, were issued. Nevertheless the number of "swankey shops," or "ons," continued to increase, and the "offs" to diminish. In ten years the quantity of malt paying duty increased by ten million bushels. A slight diminution in the consumption of spirits followed, but was not long maintained.

Beerhouse Act, 1830.

Public-houses.

The statistics of the number of publicans' spirit licences in England and Wales show a continuous diminution in proportion to population. In 1889 the total of intoxicating liquor licences was 181,297. The licences in 1830–9 amounted to 6·30 to every 1,000 of population: in 1860–9, to 5·57. After Selwin-Ibbetson's Act there was a drop from 124,173 in 1869 to 116,759 in 1871, or in beer-house licences from 48,967 to 42,607. In 1885 the proportion was at about 4·54 per 1,000.

The statistics of consumption show an increase over the years 1831–85 as compared with 1761–1821 in the consumption of British spirits per head, with a diminution in malt; but this increase is more apparent than real, for the statistics are estimated on duty-paid spirits, and in the earlier period the

THE DRUNKARD'S CHILDREN. BY GEORGE CRUIKSHANK.

quantity of spirits which escaped duty cannot be ascertained. Smuggling and illicit distillation, whenever duties were high, deprived the Government of a large part of the dues that should have been paid for home consumption. During the war and till 1823, duty was charged at 11s. 8½d. for English spirits, for Scotch and Irish 5s. 6d. a gallon; then the duty fell, on English to 7s. 6d., on Scotch to 3s. 4d., on Irish to 2s. 4d. Between 1823 and 1839 the consumption of duty-paid English and Irish more than doubled, and Scotch trebled; yet this increase doubtless does not point to an actual doubling of consumption. The increase was maintained after the tax on spirits was made uniform at 10s. a gallon in 1860. It would appear, then, that in the present century increase of duty within certain limits has not prevented increased consumption, and no longer leads, as once it did, to smuggling and illicit distillation.

**Committee of 1834.**

In 1834 a Select Committee of the House of Commons sat to consider means to prevent drunkenness, and came to the conclusion that the vice had declined in the upper classes but increased in the lower. The committee were prepared to enforce drastic measures, such as Sunday closing, the opening of retail-shops to the view of passers-by, the reduction of duties on tea, coffee, and sugar, the abolition of the issues of spirits to the Army and Navy, with a view to the ultimate prohibition of all foreign importation and of home distillation. These proposals were out of harmony with the public opinion of the time, and only the mildest of the suggestions have since been put in force. The evidence collected by the Lords' Select Committee on intemperance, 1877–8, led them to report that recent legislation had not diminished drunkenness, that it had not increased in rural districts, but had increased in towns, especially during the five or six years of prosperity which followed 1868. They held that there was a vast increase of female intemperance, and summed up that there was no evidence to prove that the country was in a *worse* condition than it was thirty years ago. This verdict was certainly not unduly optimistic.

**Drunkenness.**

The statistics of drunkenness, which, of course, bear no necessary relation to the consumption of spirits per head of population, are not easily ascertained, for the tables of apprehensions and convictions at police courts are often affected by

changes of magisterial practice. On the whole, the tendency has been to make drunkenness more distinctly a petty criminal offence: drunkards are no longer, as before 1833, "taken care of" by the police, and dismissed, when sober, without being entered on the charge-sheet. But it seems that 1865, looking back on 1835, saw an improvement; this included the period when the taxes on all British spirits were made uniform, and the tax on tea was reduced by one-half; 1885, looking back on 1860, saw neither improvement nor the reverse. But as there was greater police vigilance and an increased readiness to convict, it is possible to escape the conclusion that there was as much drunkenness as ever.

Wines.

The Cobden Treaty of 1860 to encourage the lighter French vintages had a marked effect on the consumption of light wines in the United Kingdom. In 1801–3 only 274,000 gallons of French wines were drunk, with over 7,000,000 gallons of other wines. In 1880, of over 17,000,000 gallons imported, the French contribution was nearly 7,000,000. From 1858–60 the average annual consumption of all foreign wines was about 6,600,000 gallons: from 1882–4 over 14,000,000 gallons. According to Porter's statistics, the consumption of British spirits per head was, 1721–91, an average of ·62 gallon; 1791–1871, ·46 gallon, or a diminution of 25 per cent., but foreign and colonial spirits showed an increase. Malt showed a decrease from 3·76 bushels to 2·11 bushels, a fall of 43 per cent.; whereas the amount of wine imported per head of population increased by about 200 per cent., 1860–85.

Temperance.

The earliest temperance societies were American, and date from the end of the eighteenth century. In England temperance societies of the modern type date from 1829, when Professor John Edgar at Belfast, G. W. Carr at New Ross, and John Dunlop at Glasgow, acting independently, started societies with members pledged to abstain from intoxicating liquor. A year later H. Forbes started one at Bradford: in 1832 Joseph Livesey, of Preston, and six others pledged themselves to total abstinence, and one of their friends created a word when he declared in a speech that "nothing but te-te-total would do." In 1834 the Commission on drunkenness proposed that temperance societies should be encouraged and established throughout the country. This recommendation, however, was little likely

to find acceptance in high quarters: for William IV., though he hated drunkards, hated water-drinkers no less. When King Leopold was dining with him, the king exclaimed, "What's that you are drinking, sir?" "Water, sir." "G—— d—— it, why don't you drink wine? I never allow anybody to drink water at my table." He himself drank a bottle of sherry daily at dinner.

It was not long before the advocates of temperance and of teetotalism found their differences irreconcilable. But the movement was unchecked. Father Theobald Mathew, President of the Total Abstinence Society in Cork, began in 1838 to become famous for his marvellous influence over drunkards, and crowds took the pledge at his hands (p. 337). A fruitful source of evil, in the belief of the Commissioners of 1834, had been the meeting of benefit and friendly societies in public-houses, where a part of the funds was always spent in drink. In 1835 was founded the first benefit society on temperance principles, called the Independent Order of Rechabites. Total abstinence was shown to be an important factor in insurance statistics of health and longevity, and many other insurance societies were founded for pledged members. Co-operation with societies in all parts of the world has become a leading feature of temperance work. A special branch of periodical literature is devoted to the question, and the bibliography of temperance is rich in songs, recitations, and tracts. In 1878 the Blue Ribbon Army made its first appearance, in Hoxton. Whilst temperance as a doctrine was spreading, its practice was helped on by the opening of coffee-taverns, temperance hotels, and other places intended to offer as many of the comforts of the public-house as are possible in the absence of its temptations.

**Liquor Laws.**

The example of the Maine Liquor Law of 1851 led the temperance reformers to look to legislation for drastic measures against the liquor trade. In 1853 a Select Committee inquired into the public-houses, but no legislation followed their report. The first step gained was the Wine and Beerhouse Act of 1869, which made it impossible for any excise licences to be granted without the sanction of the justices. In 1872 the hours of sale were reduced from twenty-one to an average of seventeen, and the penalty on infringement was increased.

1685]

Any licensed person who allowed riotous or drunken conduct on his premises or who sold liquor to a drunken person was to be fined, and the conviction might be recorded on his licence. In 1874 the Licensing Act required Sunday closing during certain hours. In 1882 the justices were allowed a more extended discretion in the refusal of licences for

THE TRUE LOVERS' KNOT: THE COBDEN TREATY.

*(Reproduced by special permission of the Proprietors of "Punch.")*

consumption of beer on and off the premises than had been given in 1869, which had allowed refusal only in flagrant cases. Two important Acts are the Sunday Closing (Wales) Act, which enforces general closing except for the refreshment-rooms of railway-stations; and the Act of 1883, which forbade the payment of wages in public-houses, and embodied, after long delay, one of the proposals of the Commissioners of 1834.

Tea.

Before the war, tea had been charged an *ad valorem* duty, but in 1806 the necessities of the Government led to the raising of the tax to a uniform rate of 96 per cent. on all teas. Still in 1819 the tax was not reduced; all teas worth less than 2s. a pound paid at this rate; those worth more paid at the rate of 100 per cent. An attempt was made to restore the differential duties in 1834, but in 1836 a uniform duty of 2s. 1d. the pound on all sorts was again tried, and the consumption fell from 49,000,000 lb. to 31,000,000 lb., so that not till 1849 did the amount again stand at 49,000,000 lb. The *ad valorem* duty had enabled the poor to buy the cheapest bohea at only 1s. a pound. The new duty kept the inferior teas out of the market, and made tea cheaper for the rich and dearer for the poor. At the time when the tax on tea was 2s. 1d. a pound, the gallon of Irish whisky was paying but little more. But when the tax on whisky rose to 10s., and the duty on tea fell to 1s. 5d., the consumption of tea doubled. In 1865 the tax was 6d., and the total consumption in 1885 was 175,000,000 lb., or 4·87 lb. per head of the population, instead of 1·25 lb. as in 1837. The amount of coffee consumed has diminished in proportion to the increase of population. The consumption of sugar has increased nearly five-fold, from 15 lb. a head in 1837 to 70 lb. in 1887. In 1843 tobacco yielded to the revenue £3,711,000, in 1885 £9,250,000. This increase is perhaps partly due to the change of fashion about 1865, when the men who formerly would have been snuff-takers became smokers.

Elizabeth's reign is the only parallel in our history that can be suggested to illustrate the increase of wealth in the first fifty years of the Victorian era. It is estimated that the amount of income which would have been liable to income-tax assessment in 1837 was not more than £270,000,000; in 1887 it was £630,000,000, or, per head of population, £17 instead of £10. In 1837 the total income of the country divided among the population would have given £150, in 1887 £256 per head. Savings had increased from £14,000,000 to £90,000,000; houses of over £10 rental from £12,500,000 to £60,000,000.

Comfort: Matches.

But the period is unlike the reign of Elizabeth in that the growth of comfort has been due less perhaps to increase of wealth than to the powers of human invention. Not only do

1385]

a larger number of people enjoy luxuries formerly confined to the few, but the present century is rich in discoveries which help to increase the comfort of all classes. The inventor of the first practical friction matches deserves a high place in the list of the benefactors of humanity. The old method of obtaining light by letting sparks, struck from flint and steel, fall on tinder, whence the sulphur-tipped spunk or match was ignited, was the only method in general use at the beginning of the century. In Paris a small quantity of phosphorus matches had been made since 1805. In 1827 John Walker, a druggist, of Stockton-on-Tees, invented matches tipped with sulphur, sulphide of antimony, and chlorate of potash. These he called Congreves, after Sir William Congreve, inventor of the Congreve rocket. They were sold at the rate of 1s. per box, containing eighty-four matches, with a piece of glass paper folded through which each match had to be drawn to strike it. The Congreves were followed in 1830 by the noisy Pro-

TINDER BOXES, FLINTS AND STEELS. (*Victoria and Albert Museum.*)

metheans, which were made of paper, rolled and tipped with chlorate of potash and sugar, with a thin glass globule attached containing sulphuric acid, which was liberated when the glass broke as it was rubbed on a rough surface. In 1833 phosphorus matches began to be imported from Austria and South Germany in quantities of commercial importance.

Mineral Oil.

The uses of mineral oil were unknown commercially till 1859. Petroleum springs till then were suffered to run to waste; all that was drawn was sold as a liniment called "American oil." In 1847 E. W. Binney had found that the oil from a Derbyshire spring could be used for lamps, and when the Alfreton spring was exhausted Mr. James Young, of Glasgow, decided to distil from the Boghead coal near Bathgate, and carried on the works till 1866. By that time the American springs were sending immense quantities into the market at cheap rates.

By the use of mineral instead of fixed oils it was possible to greatly simplify the mechanism of lamps. By the use of paraffin and stearine, candles of the cheaper sort were improved. Gas was introduced more freely into private houses as it became less expensive, as the service pipes and burners were improved, and the fear of explosions passed off. In 1821 it was still thought a great luxury.

Minor Comforts.

The cleansing properties of paraffin have also made great changes. Soap has been improved and cheapened. Blacking was a source of constant trouble to the Georgian dandy, who failed to produce with champagne so good an effect as Day and Martin secured with their cheap mixture, sold in stone jars to escape the glass-tax. Numbers of such small changes can easily be called to mind. Of much importance as affecting the public health and the appearance of towns was the withdrawal in 1831 of the tax on slate-roofing, and in 1851 of the window-tax.

Food.

The duties of housekeeping have been lightened in innumerable ways. Bought jams, preserved foods, tinned, bottled, fresh and dried foreign productions of all kinds, make it no longer necessary for the housekeeper to be generally a year in advance of time, with a store-room that would supply the needs of a besieged garrison, which yet must be continually replenished as the preserving seasons come round.

1885]

The present century had made it usual among the upper and middle classes to eat meat at three meals in the day. Meat-breakfasts are modern institutions. In 1845 Sir W. P. Lennox, recounting the pleasures of a stay at Horton, says there was at breakfast always a bill of fare sent up from the kitchen. Instead of having the sideboard covered with dishes of cutlets, grills, kidneys, eggs and bacon, etc., which get cold and clammy unless quickly attacked, a *carte* was put in the hands of every guest as

THE FIRST FARMHOUSE JAM FACTORY, 1873.

*(By permission, from a photograph supplied by Messrs. Chivers.)*

he entered the room, from which he made his choice. Tea, coffee, etc., were handed, and not poured out by the hostess; to see the hostess pour out he found as odious as for the guest to be asked to carve. How shocked would William Harrison have been had he been present at this breakfast! (Vol. III., p. 540.) Among the poor, too, it is certain that much more meat is eaten than at the beginning of the period. The importation of foreign meat at low prices has done much to bring this about. Many more are the minor changes affecting domestic comfort. Lennox speaks with enthusiasm of the supply of baths at Horton. Hot water, fires in bedrooms, armchairs, were comforts rarely enjoyed by the middle classes till the last half of the period. The poor of London were provided with the first public bath and

wash-house in Glasshouse Yard in 1845. The catalogue of such details may be almost indefinitely prolonged.

**Provincial Life.**

The vast growth of the urban population has changed the character of English provincial life within the period. By the middle of the century more than one-third of the population of England and Wales dwelt in towns of over 20,000 inhabitants, and the great centres of population have changed with a rapidity unknown to previous centuries. In 1825 Dublin was second only to London; in 1851 Manchester, Liverpool, and Glasgow stood before it. Manchester, which in 1825 had 140,000, in 1851 had 401,321; Liverpool rose from 120,000 to 375,955. Glasgow stood fourth in 1825 instead of second as now. Edinburgh and Birmingham followed, and only these six towns had over 100,000 inhabitants. Bristol with 80,000, Leeds, Sheffield, Plymouth with from 50,000 to 60,000, brought up the rear. In 1851 Leeds had risen to 172,270; Bristol and Sheffield followed with over 135,000. In 1816 no Middlesbrough existed; Swansea was a village. With this vast growth has come an increase in the importance of local interests, in local opportunities of every kind. A large number of wealthy people can enjoy a varied life without staying long in London. A country holiday, long or short, is now considered a necessity by all classes except the very poor. Although the importance of London to the whole country is fully as great as ever it was, London influences now go out to the country; it is less necessary to be constantly in London in order to be in touch with the world. The harder it was in old times to reach London, the more determined were the efforts of fashionable people to get there; now that it is easy to go people come and go incessantly. All classes know each other somewhat better now; the arrogance of the aristocracy is less insolent, the bitterness of the democracy less uninformed and ignorant. It is no longer only in "contests with the clods" that rich men and poor have their one opportunity of meeting on equal terms. In every large town now there are many who take to heart the existence of an "East End," who are concerned with the problem of the social duties of the rich to the poor, and who realise something of the difficulties of philanthropy: where formerly it was possible to number the more energetic philanthropists, now their name is legion.

**Growth of Great Towns.**

**Mingling of Classes.**

Home Life and Society.

Precedence and etiquette in the first half of the century had been supremely important matters in provincial society, and those who loved the artificialities of civilisation found in them compensation for the dreariness of life. The importance assumed at one time by small domestic incidents which would nowadays be ignored makes it appear that our lives are flat and colourless in comparison with those of our ancestors. Those, again, who

TOYNBEE HALL, WHITECHAPEL.
(*By permission, from a photograph supplied by the Secretary.*)

enjoyed nature and the charms of a simple life had opportunities which rarely come to us. It was not then, as now, only the favoured few who can keep pigs, kill them, and make black puddings, sausages, and hams at home. It was suffered then in the heart of the largest towns. It was easier with a little energy and invention to create a sensation and to dazzle the neighbourhood: a little intellectual effort went a long way. Outside the family circle women, it is true, had not much to look for, but within there was freedom, even variety. It is possible that more pains were taken then to make home happy by those whose gifts lay that way, since in the home life lay the only chance of

happiness. The naturally gay were, it would seem, more gay; the little excitements of life were more exciting. But those were not happy times for the gloomy-minded, for provincial people who had any sorrows to forget: there was no chance to escape from woes in the hurry of an active existence. As life becomes busier for all classes the desire for pleasure grows stronger, and with larger educational and intellectual opportunities for both sexes the possibilities of pleasure have become more varied, while the development of taste has given fuller consciousness to the sense of enjoyment. The demands made on life are greater, and to him that asks much, much shall be given. Goodness becomes more attractive, for it is not identified now, as once it was, with religious strictness, with the forbidding of pleasure, of theatres, of dancing, of cards: it is no longer conceived as a mere negation of evil, it has more of positive quality. Blake has as a motto of Hell: "Damn braces, bless relaxes." Who knows but it may yet prove to be a motto of Heaven?

JAMES COLVILLE. Scotland.

SCOTTISH legislation has tended more and more to assimilation with that for England, but certain great movements, reflected in the English statute-book, have had their counterparts in the North as adapted to the special circumstances of Scotland—notably, Elementary Education, Endowed Schools, Public Health, Road Reform, and Local Government. Crofter Acts, again—a conspicuous feature—may be regarded as a reflex of the Allotments Act and the Irish Land Bill.

Education

Not till 1872 was there secured a settlement of the long-pending question of education. The Act transferred control from the clergy to School Boards, relieved landlords from the burden of maintenance of schools and of teachers' salaries, and laid this on the general community. The religious difficulty was solved by neither prescribing nor proscribing, all being left to the arbitrament of the local ballot. The Presbyterian churches practically withdrew from the field, so that the Voluntary schools difficulty has no existence in Scotland. All parties find in the cumulative vote a tempting instrument for keeping alive sectarian ambition and jealousies. The old system had broken down most seriously in the larger towns, and here the secondary education, long

supplied by grammar schools, soon found itself in competition with that developed by the Act. To remedy this the Endowed Schools Act (1882) secured for secondary education enormous funds, the fruit of ages of pious bequest, thus handing over to the well-to-do what had in most cases been designed for the poor and needy.

The Act of 1858 enormously stimulated the higher learning

GLASGOW UNIVERSITY

on lines laid down by Dr. Chalmers in his evidence before the Commission of 1828, but did little to remove the weakest point in the Scotch University system, the preponderance of professorial lecturing over teaching. The later Act of 1890 has effected radical changes in the constitution of the Universities. The most notable academic event of the time was the removal of Glasgow College from its old and limited site in the heart of the city to the commanding eminence of Gilmour Hill (1869), at a total cost of little short of half a million. In the same year Edinburgh Medical School was successfully stormed at last by five women students. Universities.

Public Health.

Under the Act of 1867, amended 1879, rural and urban sanitary districts were created, and for the first time the duty of guarding our social and industrial environment was made a legal claim on the whole community. The period has seen the fruits of such measures as the Improvement Acts for Edinburgh (1865) and Glasgow (1866). The marvellous advance in the standard of well-being and taste is shown by the fact that all the large towns have been almost entirely rebuilt within living memory, and this on a scale that marks a revolution in public feeling. Open spaces in towns, long overlooked, are now appreciated. Edinburgh led the way in this direction by laying out the Meadows as a public park in 1853. The tramway appeared first in Glasgow in August, 1872, immediately after the lead of Liverpool and London. A change, equally vital to the country districts, was the much older measure of Road Reform, originating in 1845 and consummated by the Act of 1881, which substituted a general assessment for the machinery of tolls and local trusts, heavily burdened with debt. After June, 1883, tolls ceased to exist. The supply of water and gas in large towns was gradually assumed by municipalities. Here the example of Glasgow and Edinburgh spread to the rural districts, where the Local Government Act (1885) has given corporate life to scattered communities. It restored the office of Scottish Secretary, combined shortly after the Union with that of the Lord Advocate.

Industry.

Scotland has played a leading part in the greatest engineering advance of recent times, the manufacture of steel and its applications on the largest scale. The Steel Company of Scotland, first at Newton in 1871 and next at Blochairn in 1880, has made the Clyde the centre for the manufacture of Siemens steel (p. 746). The Forth Bridge (p. 740) was a colossal triumph for the new material. The steel for the structure was made in Glasgow, and put in place by Sir William Arrol, an engineer of that city. The bridge was begun in 1882, and opened in 1889. Previously a substantial railway-bridge over the Tay at Dundee had taken the place of the slight iron structure blown down in the terrific winter gale of 1879. Lord Kelvin's vast and varied services to physical and electrical science have been mentioned elsewhere (pp. 711, 729).

The Admiralty led the way in applying steel to shipbuilding

1885]

when Denny of Dumbarton turned out the *Redoubtable* (1874). The success of the manufacture led to a crowd of Clyde industries, notably to the building of warships. No sooner had Clyde engineers triumphed in building powerful ships of iron and subsequently of steel than they turned to such agents in effecting the best results in economy and efficiency as the surface condenser, the compound engine (pp. 464, 730), and the triple- Marine Engineering.

*Photo: Wilson, Aberdeen.*

THE TAY BRIDGE AFTER THE DISASTER OF 1879.

expansion principle. Kirke of Dumbarton successfully applied triple-expansion to the engines of the *Propontis* in 1874. There, too, William Denny, with the help of the famous Leven Experimental Tank (1883), established data for calculations which are indispensable to the modern shipbuilder. The Clyde Harbour Trust has kept pace with this rapid progress in the building of long, deep, powerful steamships. The first steam-dredger began work in 1824, and for long thereafter the material removed was used to build up the banks of the river, but in 1862 steam hopper barges were introduced for removing the dredgings to the deeper waters. Now the river from Port Glasgow to Glasgow is practically a deep-sea canal, adapted for the largest of ships. Till 1869 the river-bank supplied the quayage of the port of Glasgow, but in that year an Act was obtained for a mag- The Clyde

nificent new dock, opened in 1873, and this has been followed by others.

The Church.

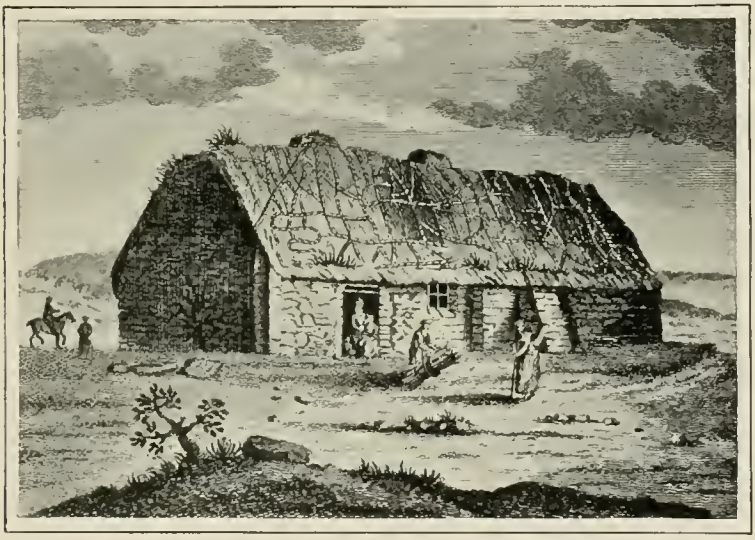
The great blow of the Disruption roused the Church to fresh efforts. By the Robertson Extension Scheme, 351 new charges were founded and endowed (1854–86). This was a striking contrast to the policy of the pre-Disruption days, when the Moderates deprecated the creation of small, struggling churches. Within the Church itself a notable liberalising process has been in progress, and this both in creed and ritual. An extremely unpopular church rate, the annuity tax, a long-standing grievance in Edinburgh, was satisfactorily disposed of in 1871. The Assembly, after a vigorous attack extending over several years (1857-69), was at last got to condemn patronage, and this led to the Act abolishing this fruitful source of trouble (1874).

Agriculture.

Economic changes have sorely crippled the oldest of industries, agriculture, bringing in their train what is almost a social revolution. Clyde triumphs in shipbuilding have contributed to this result in keeping the foreign supply of food-stuffs lucrative and expeditious. The Bell-Colman refrigerating process, a Clyde invention, was first successfully applied, about the close of the period, to sea-going vessels, when a cargo of frozen meat was brought from Australia in good condition. Extensive depopulation and consequent unequal distribution of labour have brought about changes in rural economy, which have in turn stimulated invention. Few contrivances have had more notable effects than the reaper, invented by the Rev. Patrick Bell of Carmyllie (1799–1869), and in successful and extensive operation after the middle of the century (p. 477). But the economic distress of the Lowland farmer is mild in comparison with that of his Highland compatriot. His story is told in the Report of the Crofter Commission, 1884. In the agrarian movement of which it was the outcome the Highlander made no claim to dual ownership, limiting himself to a demand for enlarged holdings, especially for grazing, and security of tenure. The period 1748–1825 (end of the clearances) witnessed far-reaching changes in the formation of big sheep-farms, entailing the appropriation of township lands, long farmed in common, and the removal of the peasant cultivators or crofters to the arable sea-coast strip, generally poor in soil and limited in area. The large farmers who took their place were often absent tenants

The Crofter Question.

of absent landlords, leaving but few natural and intelligent leaders of the community, and these scattered over wide areas. Latterly this reversion to pastoral conditions has not been a success for the sheep-farmers any more than the needy and unprogressive crofter, who, regardless of consequences, allowed the squatting of cotters to go on unchecked—a process aggravated by the perilous subdivision of his petty croft among his dependent relatives. For awhile kelp-burning diffused much



CROFTER'S HOME IN ISLAY, 1787.
("*Britannica Curiosa.*")

money, but the industry collapsed after 1851. Fishing, too, of which much had been expected, was impossible to this farming population in the absence of harbours, access to markets, and capital. Government has done very little to help. Commercial enterprise, however, stimulated by this age of sport and touring, has done and is doing far more than legislation or imperial doles. Orkney and Shetland started for itself a direct service to Leith in 1833. About the same time Burns began the West Highland trade, subsequently taken up by the firm of Hutcheson (now Macbrayne). After her Majesty passed over the Royal Route in 1847, an immense impetus was given to Highland

touring. Railways followed, beginning with the Highland (1865), extended ultimately to Wick. The Callander and Oban Railway tapped much of the west coast. But to reach the more central districts, and ultimately the remoter north-west, a railway from Glasgow to Fort William was projected. Thrown out in Parliament (1883), it was not opened till more than ten years later, and was subsequently extended towards loch Ness and Skye.

*Photo: Wilson, Aberdeen.*

CROTTER'S HOME IN SKYE, 1885.

P. W. JOYCE. Ireland The Fenian Society.

THE Fenian Society, which took definite shape in 1862, had for its object to effect the independence of Ireland by force of arms; and the members were sworn in and the proceedings were carried on in secret council. The leaders, like those of the Young Ireland party, were men of education and high moral character; and their organ, the *Irish People*, which decried constitutional agitation and openly advocated armed resistance, was conducted with great ability. In 1865 a number of the leading Fenians were arrested, including the chief organiser, James Stephens; but a few days later Stephens escaped from prison by the help of his warders, who themselves had been sworn in as Fenians. The others were sentenced to various terms of penal

servitude. The movement spread, however, not only in Ireland but also in England and America; and the ranks were swelled by the accession of large numbers of Irishmen who had fought through the recent American War. In 1867 there was a rising on a small scale, which was suppressed without any difficulty. A plan to seize Chester Castle with its store of arms was disclosed to the authorities in time enough to prevent its execution. Shortly afterwards, on the occasion of the rescue of two Fenian prisoners from a prison van in Manchester, the police officer in charge was unintentionally shot dead; for which three of the rescue party, Allen, Larkin, and O'Brien, were tried and hanged. Near the end of the same year (1867) an attempt was made to blow up Clerkenwell Prison, with the idea of rescuing a Fenian prisoner who was confined in it, which caused the death of several men and other scarcely less dreadful consequences to many people in the neighbourhood (p. 520).

These events, happening in quick succession, seriously turned the minds of Englishmen to the necessity of adopting some measures of restoring Ireland to a condition of tranquillity. It was felt that reform was needed in three directions, or, as Mr Gladstone expressed it, that the Irish Upas tree had three branches—the Established Church, the system of land tenure, and the system of national education—meaning chiefly University Education. At the end of 1868 there was a general election, and Mr. Gladstone became Premier with a great Liberal majority (p. 520). Attention was first directed to the state of the Protestant Church in Ireland. It had been originally established and richly endowed with the direct object of converting the Roman Catholic people to the Protestant faith; but so far was it from accomplishing this, that the Catholics had relatively increased, and at this time the Established Church Protestants formed only about a tenth of the whole population. After most determined opposition and vehement denunciations, the Protestant Church of Ireland was disestablished by the Gladstone Government in 1869, due regard being had to vested interests.

**The Irish Church, 1867.**

The next question was the land. In 1870 Mr. Gladstone had a Bill passed intended to secure for the tenants compensation for improvements and for disturbance in case of eviction, and also to encourage peasant proprietorship (p. 523).

**The Land Act, 1870.**

But the landlords in various ways impeded the working of the measure, so that the intention of the Legislature was carried out only to a trifling extent. Compensation for disturbance afforded little or no security: evictions went on as busily as ever—two or three thousand a year—and the population still continued to run down.

**The University Problem.**

Next came an attempt to settle the question of University Education (p. 526). There were at this time in Ireland the Dublin University—or Trinity College, as it is usually called—a purely Protestant institution, though admitting Catholics to degrees: and the Queen's University, with its three colleges, in Belfast, Cork, and Galway, founded in 1845, but having no provision for religious teaching. The Catholics demanded a University of their own, endowed and chartered, and in all respects on an equality with Trinity College. Twenty years previously the Catholic bishops had established a Catholic University in Dublin, which was supported by subscriptions and was well attended; but it had no charter and no power to confer degrees. In 1873 a Bill was introduced by Mr. Gladstone to abolish both the existing Universities and to create a central one, to which Trinity College, the three Queen's University Colleges, and the Catholic University should be affiliated: but the Bill was thrown out. Thus, so far, only one branch of the Upas tree had been dealt with successfully.

**Home Rule.**

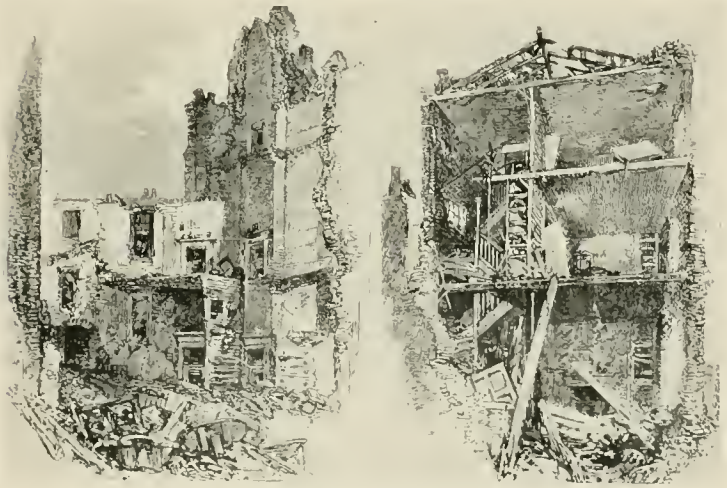
Under the leadership of Isaac Butt, a Protestant barrister, the Home Rule agitation was revived; and in the General Election of 1874 more than fifty Irish Home Rulers were returned to Parliament. Butt's motions in Parliament in favour of Home Rule were, as usual, easily voted down, on which the Home Rulers turned their attention to the land; but their efforts in Parliament for land reform were fruitless.

**Secondary Education.**

The Irish Intermediate Education Act, which was passed in 1878, provides for intermediate (or secondary) education, by yearly public examination of students, by awarding prizes and exhibitions to successful students, and by paying results fees under certain conditions to managers of schools. The expenses are defrayed from a portion of the funds of the Disestablished Church. This, like the National System of Primary Education, has been very successful.

The condition of the small farming classes continued so alarming that the land question now overshadowed all others; and about 1879 the Land League was formed by Michael Davitt, a league destined to exercise a most important influence on Irish affairs. In the following year Charles Stewart Parnell, the greatest figure in Irish political history of the latter half of the century, became the leader of the Irish party. In the same

**The Land League.**



AFTER THE EXPLOSION IN CLERKENWELL, 1867.

(*Reproduced by permission of the Proprietors of the "Illustrated London News."*)

year (1880) there was a General Election (p. 533), and the Liberals came into power with an overwhelming majority. The land agitation grew more violent than ever, for evictions rather increased than diminished, and the practice of boycotting began to be resorted to. The methods of the people were similar to those carried on during the tithe war (p. 148), and for a time boycotting became a leading feature in the land agitation. An unsuccessful attempt to convict and punish the leaders of the Land League was followed by Mr. Forster's Coercion Act, giving power to arrest all persons "reasonably suspected" of certain specified offences. While this Bill was passing through Parliament, the system of Parliamentary Obstruction, which had been brought to great perfection by Parnell and Biggar, came into full play, and the proceedings

were greatly protracted. But the Bill became law in March, 1881.

The Land Act, 1881.

The first real attempt to go to the heart of the land question was made by the Land Act of 1881, passed by the Gladstone Government (p. 534). While passing through the

VENUS ATTIRED BY THE GRACES, 1869.
*(Reproduced by special permission of the Proprietors of "Punch.")*

Commons, what is called the "Healy Clause," exempting the tenants' improvements from rent, was inserted at the instance of Mr. T. M. Healy. Before becoming law the Bill was twice sent back to the Commons by the House of Lords, so altered as to render it almost useless; but the Commons were determined, and the Lords passed it in the end, much against their will. A Land Court was formed for fixing fair rents

and for settling disputes between landlord and tenant. The rent once fixed by this court remained stationary for fifteen years, during which there could be no eviction except for serious breach of contract, such as non-payment of rent. The Irish members, whose ideas had expanded as the land contest in

HIBERNIA WATCHING FOR THE GOOD SHIP LAND ACT, 1881.
*(Reproduced by special permission of the Proprietors of "Punch.")*

Ireland grew more bitter and protection for the tenant more necessary, accepted the measure as an instalment of what was due; and expressed their determination to have the landlords bought out, and the land put in possession of the tenants. The Act was, however, extensively made use of; and the Land Court and its branches fixed fair rents in a vast number of cases, with an average reduction of about twenty per cent.

The Coercion Act, 1881.

Meantime, under Mr. Forster's Act, great numbers of persons had been imprisoned on "reasonable suspicion"—no offence specified. At length, in October, 1881, matters came to a climax when Mr. Parnell and many of the other chief leaders were arrested and lodged in Kilmainham Gaol. This was followed by the No-rent Manifesto from the imprisoned leaders, which, however, was universally condemned by the clergy, and was not obeyed to any extent. But it led to the suppression of the Land League by Government proclamation. After the imprisonment of the leaders the state of the country became worse than ever, and murders and other outrages increased. At length the conviction forced itself on the Government that the arrest of Parnell and the others was a mistake, and did harm instead of good; and a conciliatory policy was resolved on. Mr. Forster's Act was dropped, and the suspects were all released; whereupon Mr. Forster resigned the Chief Secretaryship, and Lord Frederick Cavendish was appointed in his place. But the hopes of peace and tranquillity were dashed by a terrible crime. There had grown up in Dublin a secret society calling themselves "Invincibles," whose chief agency in carrying out their plans was assassination: and on the 6th of May, 1882, Lord Frederick Cavendish and Mr. Thomas Burke the Under-Secretary, were murdered in the Phœnix Park, Dublin (p. 537)—a crime which created no less horror and grief in Ireland than elsewhere. This terminated for a time the policy of conciliation, and a stringent Coercion Bill was passed. After some further attempts at assassination the murderers were brought to justice; five of the Invincibles were hanged, and others were sent to penal servitude. These events

*Photo: Lawrence Dublin.*
CHARLES STEWART PARNELL.

The Phœnix Park Murders.

were followed by a series of dynamite outrages in London in 1884 and 1885, which had been concocted in America; but these, too, ceased on the lapse of the Coercion Act. The remaining events of 1885 (p. 540), need no special detail here.

Of late years the ancient Language and Literature of Ireland have attracted much attention. The movement began

SCENE OF THE PHŒNIX PARK MURDERS.

about half a century ago; and it will be interesting to sketch the progress of Celtic learning during that time, so far as it concerns Ireland, and to indicate its present position and future prospects. The study is a difficult one, for the Gaelic texts preserved in manuscripts comprise specimens of the language dating from the seventh century downwards; and as Irish underwent, from century to century, those gradual changes that every living language is subject to, the Gaelic of the early centuries differs at least as much from the modern language, in vocabulary, orthography, and inflection, as the language of Chaucer does from that of Tennyson. In the case of Irish, moreover, there is this additional element of

P. W. JOYCE. Celtic Scholarship.

difficulty: that the continuity of the written language was broken by the wholesale destruction of manuscripts during the Danish and Anglo-Norman invasions; so that we have now numerous early pieces containing words, phrases, and allusions which no one has hitherto been able to explain. These obscure old texts are chiefly contained in manuscripts preserved in Dublin.

**The Keys to the MSS.**

In Continental libraries there are numerous copies of the Latin classics, full of interlined and marginal glosses or explanations, in Irish, of the words and phrases of the Latin text, written by Irish teachers, mainly for the use of those of their Irish pupils who were learning Latin. They were written during those ages when Irish scholars and missionaries frequented the Continent and were employed as professors in many of the French, German, and Italian schools and colleges. By the help of these glosses, which date from the seventh to the ninth century, the meanings of innumerable Irish words and phrases, long lost, have been recovered, by reversing the original intention—the Irish being now explained by the Latin, instead of Latin by Irish. By means of these glosses also, and of those of the other Celtic dialects, the great German scholar, Johann Kaspar Zeuss, constructed his "Grammatica Celtica," a complete grammar of the four ancient dialects of Celtic—viz. Gaelic, Welsh, Cornish, and Breton—which first directed the attention of Continental scholars to the importance of the subject. This great work, which was published in 1853, laid the foundation of Celtic philology. Since his time a great many of the Continental glosses have been published, chiefly by German, French, and Italian scholars.

**Irish Celtic Scholars.**

About fifty years ago the Celtic and Archæological Societies were established in Dublin, under whose auspices Dr. John O'Donovan translated and annotated, with great learning and research, a number of Gaelic texts, forming several volumes. The most important of all his works, however, was his edition of the Annals of the Four Masters, which has been mentioned already (Vol. IV., p. 276). In these several works O'Donovan rediscovered, as it were, and restored the ancient historical topography of Ireland, which, when he began his labours, had been all but lost. His fellow-labourer, Professor Eugene O'Curry, delivered a series of lectures in the

Catholic University, Dublin, on the Manuscript Materials of Irish History, which were published in one volume in 1861, and at once turned attention to the vast amount of ancient Celtic lore contained in the collection of manuscripts preserved in the libraries of Trinity College and of the Royal Irish Academy in Dublin. Another series of his lectures, of equal importance, on the Manners and Customs of the Ancient Irish People, was published after his death, edited by Dr. W. K. Sullivan, of Cork. O'Donovan and O'Curry translated the Brehon Laws, a task of enormous difficulty, on account of the technical nature of the subject and the archaic and elliptical forms of expression. Four volumes of these ancient laws have been lately published, and two more, under the editorship of Dr. Robert Atkinson, are on the eve of publication. What Zeuss did on the Continent these two great scholars, O'Donovan and O'Curry, did in Ireland; they led the way in the proper scientific method of investigating and illustrating the contents of our ancient Gaelic manuscripts, and laid the foundation of Gaelic scholarship at home. Contemporary with O'Donovan and O'Curry were three other scholars—the Rev. Dr. William Reeves, author of several important works on Irish literature, among them his edition of Adamnan's Life of St. Columba, a monument of exhaustive accurate learning: the Rev. Dr. Todd, who edited the Irish Book of Hymns, the "Wars of the Irish with the Danes," with translation, and left several other important works: and Dr. George Petrie, who set at rest the question of the origin of the Irish Round Towers, in his great work on the "Ecclesiastical Architecture of Ireland," and who, though not himself a Gaelic scholar, was in fact the guiding spirit in the

*Photo: Lawrence, Dublin.*
EUGENE O'CURRY.

movement for the study of the language and antiquities of Ireland.

**The MSS. Published.**

The circumstance which gave, perhaps, the greatest stimulus of all to Celtic investigation was the publication in *facsimile* by the Royal Irish Academy, since 1870, of the most important of the Dublin Gaelic manuscripts—viz. "The Book of the Dun Cow," "The Book of Leinster," "The Speckled Book of MacEgan," "The Book of Ballymote," and "The Yellow Book of Lecan"—which contain nearly all the important texts. Copies of these books are now in all the principal libraries of Europe, so that scholars everywhere have opportunities of studying them without coming to Dublin; and the opportunities have been turned to excellent account. Several periodicals are now published on the Continent and in Great Britain devoted either wholly or partly to Celtic learning, such as the *Revue Celtique*, *Melusine*, the *Archæological Journal*, etc.

**Celtic Scholars at the close of the Century.**

Among living workers, Dr. Whitley Stokes must be singled out as by far the most distinguished. He has translated and edited a great number of Gaelic glossaries, ancient romantic tales and lives of saints, the Tripartite Life of St. Patrick, the "Feilirè," or poetical catalogue of saints, written by Aengus the Culdee, with many other texts; and the results of his labours will be found partly in separate volumes, and partly in the pages of the *Revue Celtique* and other periodicals. Dr. Standish Hayes O'Grady gave to the world in 1892 a most important work, "Silva Gadelica," consisting of text and translation of thirty-one ancient tales, with annotations. The Rev. Edmund Hogan, S.J., among other works, published the "Battle of Rossnaree," with original text and translation; and the Rev. Dr. B. McCarthy translated the latter part of the "Annals of Ulster," in continuation of the translation of the earlier part by the late W. M. Hennessy, who also translated the "Annals of Loch Cé" and the "Chronicon Scotorum." All the scholars hitherto named, except Zeuss, are, or were, Irishmen. But many others are working with equal enthusiasm and success in the same field. In Germany Ernst Windisch and H. Zimmer, and in France H. D'Arbois de Jubainville, have brought a vast amount of learning to bear in illustrating ancient Irish lore of every kind: they have published texts and glossaries, essays on Irish mythology, laws, literature, philology, descriptive

PAGE FROM "THE YELLOW BOOK OF LECAN."

(*Reproduced from the Facsimile by permission of the Royal Irish Academy.*)

catalogues of manuscripts, etc. In Dublin Dr. Robert Atkinson has printed several texts with glossaries, some with and some without translation; and he has in preparation a glossary of the Brehon Laws, and a still more important work, a complete lexicon of the Gaelic language, both ancient and modern. Professor Kuno Meyer, of Liverpool, has published a number of Irish tales with translations, some in separate volumes and some in the *Revue Celtique* and other periodicals. Notwithstanding what has been done, however, the principal text of all still remains untranslated and unpublished. This is a long story called the "Táin bo Chuailnge," or the "Cattle Spoil of Quelna," the Irish epic, contained in "The Book of the Dun Cow," and "The Book of Leinster," which, from its great difficulty, has hitherto deterred Celtic scholars from dealing with it. It is, however, understood that Ernst Windisch has prepared a German version, and it is to be hoped that the text with the German translation will be soon given to the world.

From the foregoing sketch some idea may be formed of the amount of learning and labour expended in illustrating the ancient lore of Ireland. Moreover, the subject is attracting more and more attention, and the number of persons engaged in the investigation increases year by year; and it may be asserted that it excites almost as keen an interest among scholars as we see manifested by the public of learning in the study of Egyptian and Assyrian literature and antiquities.

J. SCOTT KELTIE. British Exploration, 1815-1885.

THE continuous and almost world-wide war which was waged from 1793 to 1815 was not favourable to the work of exploration; but when the Napoleonic incubus was removed in the latter year, an impetus was given in this, as in other directions, to British activity, which grew with the century. But even in these oppressive years explorers were not entirely idle.

The Arctic Regions.

Soon after 1815 Polar exploration was renewed with increased zeal. Captain Scoresby, it may be mentioned, in 1806 reached, on the north of Spitzbergen, a latitude of 81° 12′ 42″. In 1818 two Government expeditions were despatched—one under Captain Buchan, with Lieutenant John Franklin as second in command, to Spitzbergen, and the other under Captain John Ross, with Lieutenant Edward Parry as second, to Davis

Straits. The former was unfortunate, but the latter may be said to have rediscovered Baffin's Bay. In the following year Parry succeeded in pushing through Lancaster Sound and Barrow Strait, passing the Parry Islands on his right to Melville Island, about half-way to Behring Strait. In a second expedition (1821–3) Parry discovered Fury and Hecla Strait, separating Melville Peninsula from Cockburn Land;

PASSAGE THROUGH THE ICE, JUNE, 1818.

(*Sir J. Ross, "Voyage of Discovery in H.M.S. 'Isabella' and H.M.S. 'Alexander,'" 1819.*)

and in a third attempt (1824) entered Barrow Strait, and explored the channel leading to the south, which he named Prince Regent's Inlet. At the same time that Parry tried to push his way from the east, Captain Beechey entered the Arctic Sea by Behring Strait (1826), and succeeded in reaching Point Barrow, 156° 31′ W. With these two expeditions a third co-operated by land under Captain John Franklin. Before this, however, Franklin had succeeded in laying down a considerable stretch of the coast of Arctic America. In 1819–22, accompanied by Dr. Richardson and two midshipmen, Back and Hood, Franklin made his way by the Saskatchewan and the Barren Grounds to the Coppermine river, which he

followed, descended, and explored the coast to the east for 500 miles, as far as Cape Turnagain. On his next expedition—that of 1826—Franklin, again accompanied by Dr. Richardson, descended the Mackenzie river, and laid down the coast of the continent through 37 degrees of longitude—as far east as the Coppermine river, and as far west as the 150th meridian, within 160 miles of Beechey's farthest. Meantime, on the east coast of Greenland, Captain Scoresby succeeded (1822) in penetrating the ice-barrier and carrying out a survey from 75° N. to 69° N.; and in 1823 Captain Sabine conducted a series of pendulum observations on the same coast, in 75° 30′ N., surveying the coast from 72° to 76° N. One of the most interesting attempts to penetrate northwards was that made by Captain Parry in 1827, when he proceeded to Spitzbergen in the *Hecla*, and, setting out upon the ice in sledge-boats, reached 82° 45′ N., which for nearly half a century was the record northern latitude.

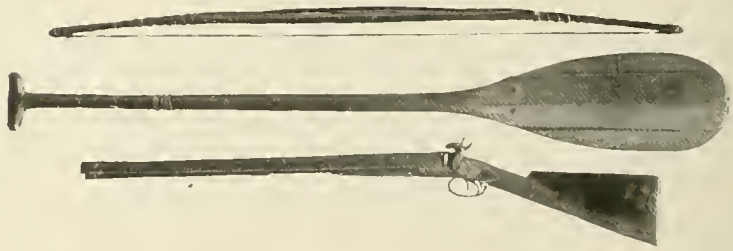
The next important Arctic expedition was equipped by Felix Booth, and placed under the command of Captain John Ross and his nephew James Ross. This expedition left England in 1829 in the *Victory*, and proceeded down Prince Regent's Inlet to its continuation, which was named the Gulf of Boothia, the projecting peninsula on its left receiving the same name, Boothia. Expeditions were made across the peninsula, on the west side of which, on June 1st, 1831, the Magnetic Pole was discovered. King William's Land, on the west of Boothia, was discovered and named, and to some extent explored. The Rosses—who passed four winters on the shores of Boothia and North Somerset, and had at last to abandon their vessels—were rescued (1833) by a whaler in Barrow Strait. In 1833 Captain Back was sent out by land to search for the Rosses. In 1834 he descended the Great Fish river, but want of supplies prevented him from proceeding beyond its mouth. Nor was he more successful in 1836 in his attempt to complete our knowledge of the northern shores of America. This work was ultimately achieved by employees of the Hudson's Bay Company. Simpson and Dease in 1837 connected the work of Franklin with that of Beechey at Point Barrow, and in 1839 they traced the coast from Cape Turnagain eastward past the mouth of the Great Fish river to Castor and Pollux river.

In 1853–4, Dr. John Rae completed the work of Dease and Simpson on the east, exploring the west coast of Boothia and proving King William's Land to be an island. Before this, however, in 1846–7, Rae had explored the great gulf (Committee Bay) on the south of Boothia Gulf. Thus, after about thirty years' work, the outline of the northern coast of America was completed.

Sir John Franklin.

Partly owing to the strong representations of Sir John Barrow, in 1845, the Government of the day resolved to make another attempt to discover a practicable north-west passage, and in June of that year despatched the *Erebus* and *Terror*, under the command of Sir John Franklin, who was well supported by Captain Crozier, Captain FitzJames, and other naval officers, and by a well-selected body of men. Proceeding up Baffin's Bay, Franklin passed through Lancaster Sound and Barrow Strait, sailed up Wellington Channel to 77° N., circumnavigated Cornwallis Island, and returned to winter at Beechey Island, off the south-west coast of North Devon. In 1846 the ships proceeded down Peel Sound and Franklin Strait between North Somerset and Boothia on the one side and Prince of Wales Land on the other, towards the passage lying between King William's Land and Victoria Land, and were apparently caught in the ice near Cape Felix to the north-west of King William's Land, where they passed the winter of 1846–7. In June of the latter year Franklin died, and in the year following, no news of the party having reached England, a search expedition was sent out. Between that year and 1854 some fifteen expeditions were sent out from England and America with the hope of rescuing or, at least, of finding traces of the missing explorers. Their searches left no room for doubt as to the fate of Franklin and his men. The ships were abandoned on April 22nd, 1848. The officers and crew, consisting of 105 souls under Captain Crozier, landed on King William's Island in 98° 41′ W., and started for the mainland in the hope of being able to make their way up the Great Fish river to the Hudson's Bay Company's stations. From the testimony of the Eskimo and of the subsequently discovered relics of the expedition, it was evident that one by one the poor men fell by the way, dying of cold and starvation, most of them before reaching the mainland at all. In-

directly, the expedition led to great additions to our knowledge of the Arctic region lying to the north of America. By far the most important of the search expeditions was the double one despatched in 1850, four ships under the command of Captain Austin being sent out by Barrow Strait, while from the other side Captains Collinson and M'Clure with two ships proceeded by Behring Strait. By the former branch of the expedition Cornwallis Island was explored, M'Clintock—who had accompanied Captain Austin—proceeding to Melville Island, and his comrades Osborne and Ommanney discovering Prince of Wales Island. On the other side Captain Collinson succeeded in



BOW, PADDLE, AND SHOT GUN FROM SIR JOHN FRANKLIN'S EXPEDITION.
(*Greenwich Hospital. By permission of the Lords Commissioners of the Admiralty.*)

navigating his ship from Behring Strait along the northern coast of America, to within a short distance from where Franklin's ships were beset. But before this, Collinson's party had examined Prince of Wales Strait between Banks Land and Prince Albert Land, the latter of which was traced in a southerly direction. The shores of Victoria Land were also explored before Collinson's ship, the *Enterprise*, returned to Behring Strait in 1853. Meantime M'Clure almost circumnavigated Banks Land, visited Melville Island, and after three years he and his companions were obliged to abandon their ship; proceeding across the ice, they reached, in June, 1853, the *Resolute*, under Captain Kellett, which had been despatched through Lancaster Sound in 1852. As they returned with her crew by the same route, M'Clure may be said to have first traversed the North-West Passage. Kellett's vessel was one of four sent out in 1852 under Sir Edward Belcher by

RELICS OF SIR JOHN FRANKLIN. (GREENWICH HOSPITAL.)

*(By permission of the Lords Commissioners of the Admiralty.)*

way of Lancaster Sound. Some thousands of miles were traversed in sledges in the course of this expedition, and our knowledge of Cornwallis, Bathurst, Melville, and Prince Patrick Islands, as well as of the channels and islands to the south, was thereby completed.[1] The final expedition (1857–9), sent out at Lady Franklin's expense, under M'Clintock, not only cleared up the fate of Franklin and his men, but completed our knowledge of the shores of Boothia, King William's Land, and Prince of Wales Island. When to all this we add the work of the American search parties, it will be seen that the terrible tragedy of the Franklin expedition was productive of the richest geographical results.

Nares' Expedition, 1875.

It was not until thirty years after the departure of the *Erebus* and *Terror* that the British Government equipped another expedition for purely exploring purposes in the Arctic regions. This expedition was placed under the command of Captain Nares (p. 927), and, in the *Alert* and the *Discovery*, left England in May, 1875. It made its way through Baffin's Bay, Smith Sound, Kennedy Channel and Robeson Channel, to Lady Franklin Bay in Grinnell Land, where the *Discovery* was left, the *Alert* pushing on about forty-five miles further, to 82° 27′ N. The most striking incident in connection with this expedition was the sledge journey of Commander (afterwards Admiral) Albert Markham, who in the spring of 1876 succeeded, in the face of enormous difficulties owing to the state of the ice, in pushing his way northwards to 83° 20′ 26″, the highest latitude which had ever been attained, a latitude surpassed by only a mile or two during the Greely expedition of 1882–4. Besides this, Lieutenant Aldrich explored some 200 miles of coast on the north of Grant Land, and Lieutenant Beaumont a long stretch of the north-west coast of Greenland. On the opposite side of the Arctic area, Leigh Smith, in 1880–2, succeeded in adding considerably to our knowledge of Franz Josef Land, discovered by the Austrian expedition under Payer and Weyprecht. England took her share in 1882–3 in the international schemes

[1 Sir Edward Belcher abandoned all but one of his ships, against the opinion of his subordinates. The *Resolute* eventually drifted into the Atlantic, was picked up by an American whaler, bought by subscription in America, and presented to Queen Victoria.]

for circumpolar observations, by establishing a station on Great Slave Lake.

The Antarctic Regions.

British enterprise was neither so extensive nor so continuous in the Antarctic as in the Arctic. Between Cook's memorable voyage (1773: Vol. V., p. 302), when he reduced the "Great

THE COUNTRIES ROUND THE NORTH POLE AS KNOWN IN 1875.

(*By permission from the contemporary chart published by Edward Stanford.*)

Antarctic Continent" within reasonable limits, and 1815, barely anything had been done for the exploration of this part of the world. A few outlying islands, not strictly within the Antarctic area, had been discovered by British vessels in the early years of this century. Enderby Land and Graham's Land were reached by Captain Biscoe in 1831, but most knowledge was gained by the expedition sent out by the British Government in 1839–43

in the *Erebus* and *Terror* under Captain (afterwards Sir) James Ross. In the first year Kerguelen Island was surveyed; in the second year Ross pushed southwards with his two sailing vessels, and in the longitude of New Zealand land (Victoria Land) was sighted in about 70° S., with lofty mountain ranges. The land was followed to about 77° 30′ S., where an active volcano, Mount Erebus, 12,400 feet, was sighted, and an extinct volcano, Mount

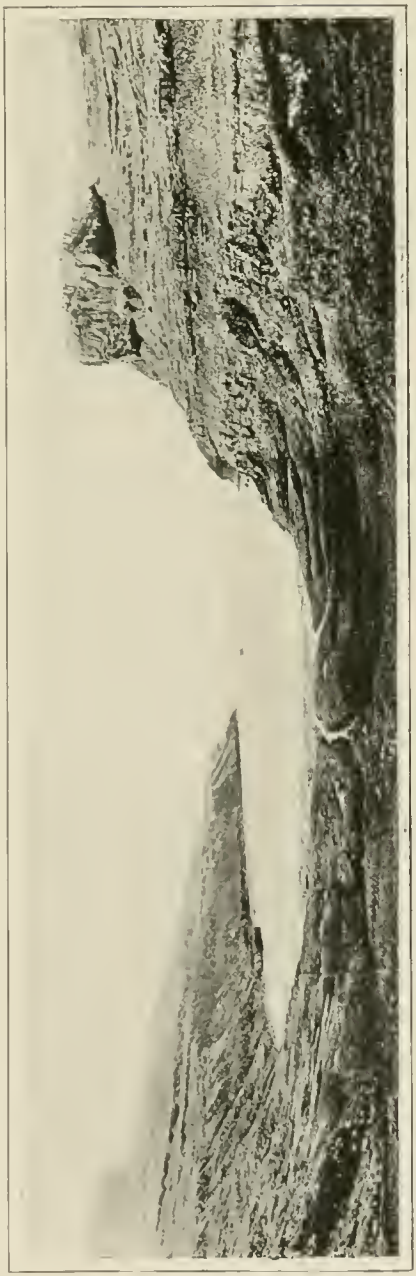
ANTARCTIC ICE, 1874.

*(By permission from a photograph supplied by the "Challenger" Office, Edinburgh.)*

Terror, 10,900 feet. Further progress southwards was impossible, owing to an impenetrable ice barrier rising to a height of 150 feet, which was traced to several degrees east, the highest latitude reached being 78° 11′ S., in February, 1842. In 1874 the *Challenger* just crossed the Antarctic circle to the south of Kerguelen Island; since then, so far as British enterprise is concerned, nothing was done for the exploration of the Antarctic till the twentieth century.

One of the greatest enterprises for the exploration of Asia by England has undoubtedly been the survey of India. Begun in 1800 at the suggestion of Major Lambton, it has been steadily carried on under a succession of able officers. The principal

triangulation of the whole peninsula was, indeed, practically completed in 1883, so that the great features of the geography of our Indian Empire are known with almost mathematical accuracy. Alongside of the trigonometrical work, topographical and cadastral surveys have been carried out, with the result that a vast amount of varied geographical information has been collected, a summary of which has been embodied in the great Government "Gazetteer of India," compiled under the direction of Sir W. W. Hunter. The coasts of India and neighbouring countries have at the same time been surveyed by officers of the Indian Navy. The official work has been supplemented by a multitude of books by officials and others, but the work of the Indian survey has extended far beyond the frontiers of the country itself. Under the superintendence of men like Sir Andrew Waugh, Colonel Montgomerie, and General J. T. Walker, the great mountain mass of the Himalayas has been sur-



CHRISTMAS HARBOUR, KERGUELEN ISLAND.
*(By permission from a photograph supplied by the "Challenger" Office, Edinburgh.)*

India and Central Asia.

veyed with approximate completeness, and many of its loftiest peaks measured, from Mount Everest (29,000 feet) downwards. In 1855 the survey of Kashmir and of the mass of mountains up to the Tibetan frontier was begun by Colonel Montgomerie, who also organised the plan of employing native explorers to make their way into Turkestan and Tibet and other parts of Central Asia, which has led to considerable gains to geographical knowledge between the meridians of 66° and 102° E. longitude. One of the most important contributions to a knowledge of Kashmir during the period was made by F. Drew, who for many years resided in the country in an official capacity. W. Moorcroft, with G. Trebeck, in 1819–25, visited Ladak, and Kashmir, Peshawar, Kabul and Bokhara. Alexander Burnes's residence in Kabul (1836–8) added much to our knowledge of Persia, as did the reports obtained by him in Sind, Afghanistan, and neighbouring countries. Lieutenant Wood, of the Indian Navy, in 1838, pushed beyond the Hindu Kush, reached the "Bam-i-Dunesh" (Roof of the World), and discovered Lake Sirikol, supposed by some to be the source of the Oxus. Dr. (now Sir) Joseph Hooker, in 1847–50, traversed the valley of the Ganges, and through Sikkim reached the higher Himalayas, adding not only to our knowledge of their geography, but collecting material which has resulted in his great "Flora Indica." Dr. Thomas Thomson was the first to cross the Karakoram Pass (1848). In 1860 Colonel Godwin Austen made a careful survey of the Mustagh region. In 1848 R. B. Shaw entered Eastern Turkestan, at the same time as Mr. G. W. Hayward reached Yarkand City. Shaw collected material for a general map of the country. The mission under Sir Douglas Forsyth in 1873 went to Yarkand and Kashgar. Colonel Henry Trotter accompanied the mission and made excursions as far as the Artysh district, and over the Pamirs into Wakhan, visiting Lake Sirikol, and throwing a flood of light over the geography of the Pamirs and Eastern Turkestan. In 1885 A. D. Carey made a journey round Chinese Turkestan and along the northern border of Tibet; and in the following year Colonel Mark Bell and Captain Younghusband went from Peking across Central Asia to Kashmir, the latter crossing the formidable Mustagh Pass.

In the early years of the century, Captain Basil Hall, while

in command on the China station, took advantage of his opportunities to visit places about which Englishmen were then peculiarly ignorant—*e.g.* Korea and the Luchu Islands. Admiral Collinson in the 'fifties investigated and surveyed the coasts of China and Tartary as far as the Sea of Okhotsk, as did Sherard Osborn the coasts of Japan and the Gulf of Pechili. Robert Fortune, a botanical specialist and excellent observer, travelled extensively in China in the 'forties and 'fifties. In 1862 Captain Blakiston surveyed the Yang-tse-Kiang for 900 miles, being the furthest point up to that date reached by Englishmen. Mr. Ney Elias in 1868 surveyed the new course of the Yellow river, and in 1872 the same excellent traveller made a remarkable journey through Western Mongolia and South-Eastern Siberia, by Uliassutai and Kobdo. In the same year Major E. R. Sladen made an important journey from Bhamo on the Irawaddy, to Momien in South-West China, partly by the same route on which a few years later A. R. Margary was assassinated, after he had successfully led an expedition from Shanghai to Bhamo. In 1877 Captain W. J. Gill made his way overland from Hankau on the Yang-tse-Kiang to Batang on the borders of Tibet, and thence by Talifu to Bhamo, making a careful survey of his route. Still more extensive studies of the geography of China were made by E. Colborne Baber, who undertook several important journeys between 1876 and 1880, particularly in the provinces of Yunnan and Sze-chuen. Another important journey across Southern China, from Canton to Bhamo, was accomplished by A. R. Colquhoun in 1881. Among the few missionaries who have been geographers, Mr. J. McCarthy in 1877 ascended the Yang-tse-Kiang to the centre of Sze-chuen province, and then proceeded south and west to Bhamo. **The Far East.**

One of the most important British contributions to a knowledge of Japan before the country was thrown open to foreigners was the narrative of Sir Rutherford Alcock, who was British Minister in Tokyo for three years. Mrs. Bishop's journey through the interior of the main island in 1879 deserves mention, as she visited parts of the country not previously seen by Europeans. In 1871 Captain Blakiston made a journey round the northern island, Yezo. **Japan.**

In 1882 and following years, Mr. Carles, British Consul, made

China. several journeys through the interior of Korea. In North China, Manchuria and Mongolia, two missionaries, A. Williamson and James Gilmore, travelled extensively in the 'sixties, 'seventies, and 'eighties. Though rather beyond the limit of this period, the journeys of Mr. H. E. M. James and Captain Younghusband in Manchuria should be mentioned, when they succeeded in ascending the "Great White Mountain."

Siberia. During the first half of the century Siberia was as unknown, to Englishmen at least, as Central Africa. Captain Dundas Cochrane in 1820 traversed the country from west to east, making excursions into the north-east of the country into Kamchatka. In the 'forties and 'fifties Charles Herbert Cottrell. S. S. Hill, and T. W. Atkinson travelled over a great area of Siberia; the last-named penetrated into Chinese Turkestan, especially the mountainous region between Lakes Balkash and Baikal, noting the advances of Russia into Central Asia. H. Seebohm's visit to the valley of the Yenissei in the spring and summer of 1877 was of special value from the point of view of physical geography and natural history.

Western Asia. The countries of Western Asia, during the present century, have been traversed by many British travellers. Colonel Leake journeyed in Asia Minor in 1800–2: his map, compiled from his own and other observations, was the best of its time. In 1808 C. J. Rich settled as British Resident in Bagdad, and till his death, in 1823, travelled extensively in that region and in Kurdistan. He visited Babylon, Nineveh, and Persepolis. In 1808–16 Morier's two journeys through Persia, Armenia, and Asia Minor were fruitful in geographical and antiquarian information, while the maps by Rennell and others were of special value. Mountstuart Elphinstone, in his important mission to Kabul in 1808–9, was accompanied by a number of specialists, all of whom made observations during their stay in the country, which still renders Elphinstone's work an authority on Afghanistan. The travels of James Baillie Fraser in Persia, in 1821 and 1833, made considerable additions to the existing knowledge of the country. One name associated with Persia, Afghanistan, and Baluchistan and neighbouring regions, for half a century, is that of Sir Henry Rawlinson. He first went to Persia on an official mission in 1833, and during five years visited various portions of the Persian Empire,

accumulating stores of geographical and archæological information. In 1843 he was appointed British Consul at Bagdad, which gave him exceptional opportunities of carrying out those researches in connection with the decipherment of Cuneiform inscriptions with which his name is so intimately associated (p. 672).

**The North-Western Frontier of India.**

Charles Masson's extensive journeys through Afghanistan and Baluchistan in the 'thirties and 'forties deserve mention on account of the fulness and value of the information which he collected. Sir A. Burnes, already referred to, travelled from India by Kabul into Bokhara in 1831–3. Stoddart and Conolly's journey through Persia and Bokhara, in 1842–3, can only be mentioned in connection with the sad fate of the travellers; Wolff's mission to inquire into the fate of the Englishman added something to our knowledge of Central Asia. In 1840 Captain J. Abbott's journey from Herat, through the desert to Khiva, yielded fresh and valuable results. Lieutenant Selby's ascent of the Karun and Dizful rivers to Shiraz in 1842 remained for forty years our only source of information on this important district. Of great importance were the labours of the Persian Boundary Commission, under Sir Frederic Goldsmid, in 1870–2. At various times between 1861 and 1872 Sir F. Goldsmid had travelled not only throughout Persia, but in neighbouring countries, in connection with the Indo-European telegraphs. One important result was St. John's six-sheet map of Persia. Between 1857 and 1872 H. W. Bellew made considerable contributions to a knowledge of Baluchistan, Afghanistan, and Persia. The name of Hontum Schindler, an Englishman in the Persian service, should also be mentioned for the many contributions he has made to a knowledge of the topography of Persia. Sir Charles Macgregor began his journeys in Persia in 1875. He travelled right across Persia, passing through Shiraz, Yezd, and Birjand, to the Afghan border. In 1877 he and Captain Lockwood explored the uninviting waste between the sea-coast and the Helmund in Afghanistan. In 1875 E. A. Floyer travelled through the almost unknown region of Bushakand, in Western Baluchistan, and by Kerman, Yezd, Isfahan, and Bagdad, reached Europe. In 1878 the surveys of various officers accompanying our army in the Afghan War made important additions and corrections on the map of Afghanistan. This led ultimately to

the Afghan Boundary Commission, under Sir West Ridgway and Sir Peter Lumsden. A host of other names (including some of newspaper correspondents) are connected with this region and with Central Asia, especially about the period of most energetic Russian advance (1870 *seq.*). The name of Lieutenant Wood is connected with an attempt, in 1840, to solve the question of the source of the Oxus; while in the 'seventies Major H. Wood explored the Lake Aral region and the Lower Oxus.

Asia Minor.

Lieutenant Wellsted, in 1829–35, besides exploring the Sinai Peninsula, and surveying the Arabian as well as the Nubian coast of the Red Sea, made an extensive journey through Omân. The Euphrates Expedition (1835–7), under the command of Colonel Chesney, was fruitful in results in many directions. Its objects were the establishment of steam communication with India, and its route lay through almost unexplored countries. Materials for a correct map of a very large portion of Northern Syria were collected; while the Euphrates and Tigris, and a large extent of their basins, were carefully explored. At a subsequent period two ascents were made of the Karun river and two descents of the Bahameshir. A new country was thus opened to navigation, commerce, and civilisation, and the practicability of the route for steam navigation established. Besides the reports of Chesney himself, W. J. Ainsworth, the surgeon and geologist of the expedition, published his special researches on the antiquities of Assyria, Babylonia, and Chaldæa, and the antiquities and geology of Asia Minor, Pontus, and Armenia were described by W. J. Hamilton. This may be said to have led to the expedition under Ainsworth and Rassam in 1839–40. From Skutari the party traversed Asia Minor in a south-east direction to the Persian frontier, their route covering thousands of miles. In the exploration of this interesting region since 1840 England has taken an important part, especially so with respect to ancient sites of Babylon and Nineveh, and other great cities of antiquity, the topography of which, the architecture, the inscriptions, and the monuments have been worked out in great detail by such men as Rawlinson, Layard, Loftus, George Smith. Further north, James Bryce[1] has described Ararat and Armenia, and in the

[1 President of the Board of Trade in 1892-1895, and perhaps best known as author of "The Holy Roman Empire" and "The American Commonwealth"; M.P. for Aberdeen; sometime Regius Professor of Civil Law at Oxford.]

Caucasus good work has been done by Freshfield, Grove, Telfer, and Dent in revealing the extent and character of the glaciation of that mighty range. Of the work of Beke in Palestine a bare mention must suffice, as also of the journey of Tozer and Crowder in Armenia (1877). In 1837–44 Sir Charles Fellows made several journeys in Asia Minor, mainly for antiquarian researches, during which he did much to clear up the ancient geography, especially of the western peninsula of Asia Minor (p. 668).

VIEW OF THE SOURCE OF THE RIVER TIGRIS.
*(Gen. F. R. Chesney, "Expedition for the Survey of the Euphrates and Tigris," 1850.)*

Of the labours of Sir Charles Wilson and his colleagues in Asia Minor (1879), the geographical results were, briefly, a complete military survey of the Taurus range, from the mountains of Lycia to the Persian frontier, of the Anti-Taurus, and of the Giaour Dagh to Mount Amanus, from the Taurus to the Beilan Pass. Surveys were also made of the Cilician Plain, of the country round Mount Argæus, of portions of Paphlagonia and Pontus, and every important road in the country was examined and sketched. In 1883 *et seq.* Prof. W. M. Ramsay carried out a careful exploration of Asia Minor, his chief aim being to identify ancient sites and roads.

Since 1840, besides special surveys of the coast referred to below, there are several important journeys by Englishmen in Arabia.

Arabia to record. First of all there must be mentioned Richard Burton's daring visit to Mecca and Medinah in 1853, by which he was able to give to the world so much valuable and new information concerning these cities and the pilgrims that flocked to them. In 1862–3 Gifford Palgrave made his famous journey through Arabia, from Damascus by Gaza, through Nejd, by Djuf, Haïl-Riad, the capital of the Wahabites, to the Persian Gulf, by the Bahrein Islands to Maskat, up the Tigris to Bagdad. Mr. Doughty's many years' sojourn and journeys in North-Eastern Arabia and in Nejd (1876 *et seq.*), as far east as Hodeida and south to Mecca, were fruitful in valuable additions, not only to geography, but to ethnology, archæology, geology, and natural history.

Palestine and Syria.

The Palestine Exploration Fund, founded in 1865, has effected a complete topographical survey of the whole of Western Palestine, and with this the names of Wilson, Warren, Conder, Kitchener, Tyrwhitt Drake, and others, are intimately associated. Not the least important of the Society's productions is the beautiful and accurate map in six sheets.

Of individual researches in this region, we need only refer to Layard's journeys through Syria in 1839 *et seq.*, the results of which have only been recently published; Churchill's long residence in Mount Lebanon, 1842–52; Allen's survey of the Dead Sea, 1849 *et seq.*, with the view of a new route to India; Porter's important researches during his five years' stay, 1849 *et seq.*, in Damascus. Burton and Tyrwhitt Drake's explorations in Syria in 1872 are a valuable supplement to the work of the Palestine explorations. Finally, the surveys conducted by the Indian Navy have completed our knowledge of the Asian coast from Suez to Singapore.

Africa.

At the beginning of the century Africa was a blank from 10 N. lat to the confines of Cape Colony. Meantime the African Association was founded in 1788. Under Captain Tuckey an expedition was sent to explore the Congo in 1816, but it did not get beyond the first rapids. Nothing fresh was added to Tuckey's discoveries till Stanley's descent of the river sixty years later.

From the Mediterranean Lyon and Ritchie reached Murzuk, while Denham and Clapperton made their memorable journey from Tripoli to Lake Chad and Sokoto. In a second expedition Clapperton, having thus completed a march across Africa, started

from the Bight of Benin, reached Sokoto again from that side, and died there in April, 1827. His companion, Richard Lander, completed his work, and determined the course of the Quorra and Niger; Major Laing reached Timbuktu in 1826. In 1820–7 Captain F. W. Owen made a survey of nearly the whole of the west and east coasts of Africa, while in 1821 much of the north coast was surveyed by the Beecheys.

To the 'thirties belong the expeditions of Lieutenant Washington and John Davidson in Morocco, Sir James Alexander's expedition into Damaraland, and James Hamilton's journey from Suakin to Khartum. In 1840 Dr. Beke made his first journey into Abyssinia, exploring the kingdom of Shoa and the province of Gojam, and visiting the source of the Abai. Our knowledge of Abyssinia was greatly increased by the journeys of Mansfield Parkyns (1843–6), and still more by Chichele Plowden, who journeyed up the Nile to Abyssinia. The invasion of Abyssinia in 1867–8 by an English army, accompanied as it was by several scientific specialists—Blanford, Markham, and others—resulted in large contributions to our knowledge of the country in its varied aspects. John Petherick was in Africa in 1846, when he travelled from Kench to Kosseir. In 1853 and afterwards he traversed the Bahr el Ghazal into the country of the Jur. In 1861–3 he, with two naturalists, Murie and Browell, traversed a great stretch of country west of the White Nile into the Jur and Niam-Niam countries. In 1845 James Richardson undertook a journey from Tripoli to the Sahara, and proceeding to Ghadames,

SIR RICHARD F. BURTON, K.C.M.G., IN PILGRIM'S DRESS.
(*From his "Pilgrimage to Almadinah and Mecca,"* 1853.)

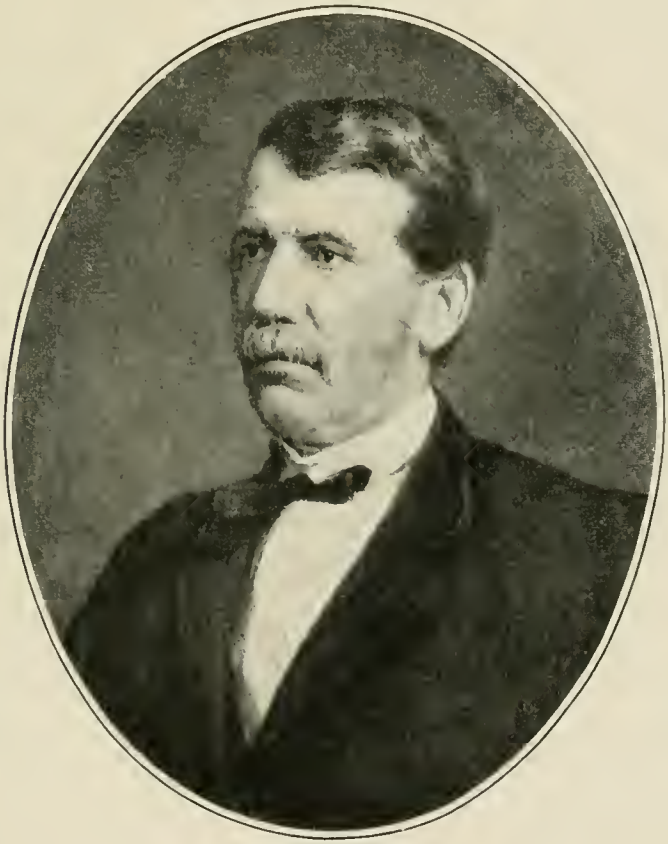
was the first European to enter Ghat, and after traversing Fezzan returned to Tripoli in 1850. The same traveller took command of an expedition into the Central Sudan, his companions being Barth and Oberweg. Richardson, after accomplishing much good work, died in March, 1851, at Ungurut, six days' journey from Kuka. The expedition, which was essentially an English one, was continued, with abundant results to science and geography, under Dr. Barth. The Central Sudan States, Lake Chad, the Shari, Binue, Niger, and the region watered by them, were explored during four years, and Timbuktu itself was visited. In 1850 Francis Galton travelled through the country of the Damara and the Ovampo, in a journey covering upwards of 2,000 miles. His companion, Mr. Andersson, extended his wanderings to Lake Ngami, and afterwards to the Okovango and Cunene rivers.

Living-stone.

David Livingstone went out to South Africa as a missionary in 1840, and he settled at Kolobeng in the far interior in 1847. His first important journey was to Lake Ngami in company with Oswell and Murray; in his second he reached the Zambezi river. After a course of study at Cape Town, he set out on his most important and famous expedition, reaching Linyanti, the capital of the Makololo, in May, 1853, and the Portuguese settlement of São Paulo de Loanda in May, 1854. From Loanda Livingstone marched across the continent along the line of the Zambezi, accompanied by his faithful Makololo followers, during which he discovered the Victoria Falls of the Zambezi. Livingstone reached Kilimane in May, 1856, and returned to England to receive that enthusiastic welcome which he had so well earned. He was appointed Consul for the Interior of Africa, and he was placed at the head of the Government Zambezi expedition. In March, 1858, Livingstone again started for the Zambezi, accompanied by Dr. (now Sir John) Kirk and other coadjutors. During this expedition the great explorer traced the course of the River Shire; and in September, 1860, he discovered the beautiful Lake Nyasa and the smaller Lake Shirwa. Livingstone returned to England in 1864.

The Livingstone Zambezi expedition (1858–64) was the forerunner of much work by English travellers and missionaries in this direction, of which the limits of our space preclude further mention. Next to Livingstone and Baines

at this period, perhaps the most fruitful traveller in South Africa was the trader and hunter, James Chapman. From Natal he visited Beehuanaland, Lake Ngami, discovered in



DAVID LIVINGSTONE.

*(From the painting in the possession of the London Missionary Society.)*

1852 the great Saltpans into which the Ngami discharges its waters; in 1855 he went from Lake Ngami to Walfisch Bay, and thence with Baines back to Lake Ngami and down the Zambezi to the Victoria Falls and on to the Indian Ocean. Baines visited in 1859 the Tati goldfields and the Matabele country, gathering much information as to its resources.

Our knowledge of the Limpopo and the region through which it passes is largely due to the explorations of St. Vincent Erskine in 1868 and 1871–2. In 1870 J. F. Elton went from Tati to the Limpopo, and traversed the region between that and the Indian Ocean. After other journeys south of the Zambezi, Elton, between 1873 and 1877, visited the Lufiji, and died while with Cotterill, pushing his way by the shore and Lake Nyasa, north and east, to Zanzibar. F. C. Selous went to South Africa since 1873. He has traversed a large area of South Africa between the Cape and beyond the Central Zambezi, and between Bechuanaland and Matabeleland, and has contributed much to the cartography of the region as well as to a knowledge of its natural history and resources.

*Photo: Gault & Fox, Piccadilly, W.*
LIEUT.-COLONEL JAMES GRANT.

While Livingstone was making his important discoveries in Southern Africa, the expedition of Burton and Speke (1857) from Zanzibar succeeded in reaching the shores of the great Lake Tanganyika at Ujiji, at a distance of seven hundred miles from the coast. On their return Speke made a journey northwards from Unyanyembe, and discovered the southern shore of a vast inland fresh-water lake, which he named the Victoria Nyanza. The expedition of Speke and Grant reached Unyanyembe in 1861, and during that and the following year they marched northward to the Victoria Nyanza, skirted the western shore of that great lake, and reached the kingdom of Uganda, discovering the outlet of the Nile at Ripon Falls. They followed the river to Gondokoro on the White Nile, which they reached in February, 1863, where they were met by Samuel Baker. Thus Speke and Grant, by their discovery of the main source of the Nile, solved a

**The Source of the Nile.**

question that had exercised the imaginations of geographers since the dawn of history.

Before Sir Samuel Baker met Speke and Grant at Gondokoro he had already made discoveries in the basin of the Atbara. He continued his explorations to the south, and discovered the Muta Nzige of Speke, a second great lake, to which he assigned the name of Albert Nyanza. In 1871 Baker, in the service of the Khedive of Egypt, while engaged in expelling the slave-traders and kidnappers, explored the kingdom of Unyoro. In 1874–9 Gordon Pasha (p. 538), Baker's successor, did much directly and indirectly to clear up still further the hydrography of the Upper Nile and obtain a knowledge of the country to the right and left of the river and Lake Albert.

*Photo: Lyd. Sawyer, Maida Vale.*
CAPTAIN JOHN HANNING SPEKE.

The English expedition for the relief of Emin Pasha (1887–9), under Mr. Stanley, shed much light on the hydrography of the Nile and the Congo: traced the course of the Aruwimi to its source; added much to our knowledge of the forest region of Central Africa and of its inhabitants, of the country on the west of the Albert Nyanza, of the lake itself, of the Semliki, which connects it with the southern lake (Albert Edward), and of Mount Ruwenzori. West Africa.

On the west coast of Africa, the British expeditions up the Niger met with some success. In 1832 Laird and Oldfield, accompanied by R. Lander, further explored the Niger (p. 910), Oldfield ascending the Benue for 105 miles. Captain H. D. Trotter in 1841–2 added much to our knowledge of the Niger mouth and neighbouring regions. The *Pleiad*, to the command of which Dr. William F. Baikie, R.N., succeeded in 1854, went

250 miles higher up the Niger than had previously been reached. A few years later he formed a settlement called Lokoja, at the confluence of the Quorra and Benue, and explored the surrounding country. In 1868 70 Winwood Reade, from Sierra Leone, in two journeys reached the source of the Niger and explored its upper course. He had previously (1861-3) spent fourteen months in the Gorilla country on the west coast. In 1879 Ashcroft, in the *Henry Venn*, carefully surveyed the Benue for forty miles beyond Yola. In 1885, on behalf of the Niger Company, Joseph Thomson ascended the Niger to the neighbourhood of Sokoto, and the company's agents have done much to explore the Benue and other affluents. Among other names connected with exploration in West Africa since 1845 are those of John Duncan, Commander F. E. Forbes, Richard Burton, J. A. Skertchly, Hewett, and Gouldsbury.

From the mouth of the Rovuma Livingstone, in April, 1866, entered on his last great African expedition. Between that and his death on Lake Bangweolo in 1873 he explored the region between Lakes Nyasa and Tanganyika, visited Lakes Mweru and Bangweolo, went on to Ujiji, thence westwards to Nyangwe on the Lualaba (the Upper Congo), back to Ujiji, where, in October, 1872, he was succoured by H. M. Stanley, with whom he explored the north end of Tanganyika. From Ujiji he proceeded south to Bangweolo, where he died. Most of the ground traversed by Livingstone was new. As an explorer, Livingstone trod some 29,000 miles of African soil, and laid open nearly one million square miles of previously unknown country. Commander Lovett Cameron, R.N., reached Ujiji from Zanzibar in February, 1874, explored the southern half of Lake Tanganyika, and solved the great problem of its outlet. He then advanced across Manyuema to the Lualaba or Congo, crossed that river, and reached the capital of Urua. Thence he pushed forward across the continent, and arrived at Benguela, on the west coast, in October, 1876.

**Sir H. M. Stanley, 1840-1904.**

H. M. Stanley's first journey in 1872, an enterprise of the *New York Herald*, was undertaken to relieve Livingstone. At the cost of the *Daily Telegraph* and *New York Herald*, Stanley undertook a second journey into the interior of Africa. In March, 1875, he reached the southern shore of the Victoria Nyanza, which he circumnavigated. He visited Uganda, crossed

towards the Albert Nyanza, and discovered the southern lake Muta Nzige (Albert Edward). Proceeding to Ujiji, he explored the southern half of Lake Tanganyika; he then marched across Manyuema to Nyangwe, and embarked on the Lualaba, which river he eventually proved to be the Congo. The distance from Nyangwe to the mouth of the Congo is calculated at 18,000 miles, and Stanley was navigating the river from November, 1876, to

LAKE NYASSA, FROM THE ISLAND OF LIKOMA.

*(From a photograph by the Universities' Mission to Central Africa.)*

August, 1877, amidst dangers in every form. This discovery has led to consequences of great commercial and political importance among other things to the founding of the Congo Free State, in which Stanley took an active part. The Rev. George Grenfell's explorations of the Mobangi, the Lomami, and other tributaries of the Congo, give him a high rank among explorers.

Alexander Keith Johnston was sent out by the Royal Geographical Society in 1879 from the east coast, to proceed by the north end of Lake Nyasa and between Lakes Nyasa and Tanganyika. He was accompanied by Joseph Thomson, a young Scotch geologist, and they landed at Dar-es-Salaam on May 19th, **Keith Johnston.**

Joseph Thomson.

1879. Keith Johnston died on the 23rd of June; Thomson, at the age of twenty-two, resolved to go forward and do his best. He proceeded to the north end of Lake Nyasa and thence to Tanganyika, and proved the Lukuga to be an outlet of that lake. On his return he discovered Lake Rikwa, east of the south end

CENTRAL AFRICA IN 1815.
*(Portion of Map published by C. Smith.)*

of Tanganyika, and marched thence to Zanzibar. In 1883–4 Thomson was again sent out by the Society. Starting from Mombasa, he went by Mount Kilimanjaro, was the first to explore the Masai country, visited Mount Kenia, Lake Baringo, and the Kavirondo countries, and added greatly to our knowledge of African geography and geology. Thomson's subsequent work in Africa lies beyond the limit of the period.

It was two German missionaries in the employment of the Church Missionary Society, Krapf and Rebmann, who in 1848 were the first Europeans to get a glimpse of Kilimanjaro. In 1865 and following years Wakefield and New not only visited Kilimanjaro, but partly by personal travel and partly by inquiries

CENTRAL AFRICA IN 1890.

*(Portion of Map by F. S. Weller, F.R.G.S.)*

among native traders, obtained much information as to the region to the north and west of Kilimanjaro and Mount Kenia, including the Masai country. In 1871 Wakefield ascended Kilimanjaro to its snow-limit. In 1884–5 Sir H. H. Johnston visited Kilimanjaro and ascended to within 2,000 feet of the summit.

Somaliland.

In Somali and Galla lands we find Smee exploring the Jub in 1811. In 1848 Captain Cruttenden, of the Indian Navy,

succeeded in penetrating some distance into the mysterious Somaliland, while one of Burton's most memorable and hazardous feats was his visit to the city of Harrar. Subsequently, at the end of 1884, the Somali country was penetrated southward from Berbera, by F. L. James (who died in 1890) and his companions, to the Shebeli, a distance of 350 miles.

Morocco.

Since Jackson's work, the most important addition to a scientific knowledge of Morocco has been made (1871) by Sir J. D. Hooker and John Ball, who made an extensive journey into that country, visiting the city, penetrating into the Great Atlas, reaching a height of over 10,000 feet, investigating its botany, and, with the aid of Maw, its geology, as well as its geography and inhabitants.

During the nineteenth century Englishmen did much for the geography and ethnology of Madagascar, with which are connected the names of Captain W. F. W. Owen, the Rev. W. Ellis, J. L. Macleod, Captain S. P. Oliver, the Rev. J. Sibree, the Rev. Mr. Baron, and other English missionaries.

North America.

Both in North and South America during the seventy years under consideration there have been many English travellers, some of whom have done good exploring work. The explorations in the northern region of Canada have been dealt with in the Arctic section. In 1840 Logan began the survey of Canada, which under Selwyn, assisted by an able staff, has surveyed a large portion of the Dominion. Of explorers outside the survey only a few demand notice. In 1857–60 Captain Palliser's great expedition was sent out for the exploration of the region between the great lakes and the Saskatchewan and the Rocky Mountains, to the Cascade Range and Vancouver, partly with a view to survey a railway route to the Pacific. As the expedition was accompanied by a staff of specialists—Sullivan, Hector, S. J. Dawson, Blakiston, Hind, and others—not only were the geographical acquisitions of great extent and value, but important studies were made on the geology and natural resources of the region. In 1862 Milton explored the Red River, and with Cheadle sought to find a route to British Columbia, exploring what was then, to a considerable extent, an unknown region.

South America.

Pentland, who resided for many years in South America (including Bolivia) as British Consul, and who was an accomplished geologist and botanist, carried on a series of explorations

(1825–37) which gained the praise of Humboldt and Cuvier. He traversed a great part of Peru, Chili, and Bolivia. He measured the most important summits of the Andes, Chimborazo, Illimani, and Sorata; Titicaca Lake was carefully surveyed by him. In 1826–36 King and Fitzroy, and subsequently Fitzroy alone, in the *Adventure* and *Beagle*, at various times carried on the survey of the coasts of South America, from the La Plata to Cape Horn, and up the whole of the Pacific coast to Guayaquil. During the later years of this long-continued survey-voyage Darwin was on board as naturalist, and his observations, including his journeys into the continent, added greatly to the value of the scientific results of the expedition. Smith and Lowe in 1834–6 journeyed down the Ucayali, Maranhão, and Amazon, and indicated the great water-routes for conveying the products of the Cordilleras to the Atlantic, the Pachitea, Ucayali, and Amazon. In 1848 Bates and Wallace proceeded to South America for the special purpose of investigating the natural history of the Amazonian region; Bates devoted eleven years to the purpose. The name of Spruce should also be mentioned in this connection. In 1852–4 Clements Markham travelled in Peru, and explored the forests of the Eastern Andean range. Again in 1860–1 he visited Peru for the purpose of obtaining cinchona plants to transfer to India, a mission which he accomplished with complete success. The extensive and fruitful explorations of Chandless in 1862–9 in the Amazonian region can only be mentioned. In 1873–5 Barrington Brown, accompanied by the botanist Traill, and Lidstone traversed the Amazon and several of its tributaries, the Tapajos, Madeira, Rio Negro, Purus, Jurua, Javary, Solimoens, and others.

Further south a noteworthy journey was made by Commander Musters, R.N., in 1872, through Patagonia, over 960 miles of latitude, in 780 of which he traversed a country previously quite unknown to Europeans. R. H. Schomburgk's extensive and invaluable botanical explorations (1835–44) in British Guiana were carried out by means of funds supplied in England. He traversed the rivers of the country to their sources, and explored in the basins of the Amazon and Orinoco. Other names connected with the exploration of British Guiana in recent years are those of Barrington Brown and E. F. Im Thurn.

In 1879–80 the journeys of E. Whymper in Ecuador were

notable, not only for the fact that he succeeded in ascending some of the great summits of the Andes, but for the observations which he made on the physical geography and natural history of the region traversed, and especially for his fresh contributions to our knowledge of the glaciation of this great mountain chain. Before this, A. Simson crossed the Ecuadorian Andes from Guayaquil.

In Brazil, besides those already referred to, there have been several English travellers and explorers who have helped to increase our knowledge of that vast region. The work of Gardner (1836–41), Burton (1864 *et seq.*), Bigg-Wither (1872–5) and Wells (1868–84) can but be barely mentioned here.

Coming further south, we must notice the varied observations of Sir Woodbine Parish in the La Plata region. At a later period the *Beagle* survey was supplemented in many important directions by that of the *Nassau*, in 1866–9, and by the very careful observations conducted in the region of Magellan Straits in 1876, by the *Challenger* staff, who landed both in Tierra del Fuego and the mainland, to carry out their scientific investigations. Still later (1878) another of her Majesty's surveying ships, the *Alert* (first under Sir G. Nares and afterwards Captain J. Maclear), visited the Tierra del Fuego region, and examined still more minutely the land on both sides. In other parts of South America, both the *Beagle* and the *Alert* expeditions did good service; the former, *e.g.*, in the Galapagos Islands, and the latter on the coast of Chile.

**Australian Exploration.**

In 1815 "Botany Bay" was still a convict settlement; no colonies in the proper sense existed, and the continent was as unknown as the heart of Africa. The survey of the coasts had been begun by Cook, Bass, and Flinders, continued by King in 1817–24, and by the *Beagle* (on which was Charles Darwin) in 1837–43, and since then in still further detail by her Majesty's survey ships. The exploration of the interior was begun immediately after the founding of the settlement. It is impossible to refer in detail to all the expeditions with which the names of Oxley, Hume, Sturt, Mitchell, Kennedy, Gregory, Eyre, and others are connected. By 1850 the continent had been penetrated for several hundreds of miles at various points, and before 1885 it had been crossed in several directions. Reference can only be made to some of the greater expeditions. One of the earliest

journeys of any extent was that of Edward John Eyre, who in 1841, in order to ascertain whether there were fertile lands in the interior, made his way from Adelaide to King George's Sound, a distance of 1,040 miles. Owing to the scarcity of water, the party suffered the greatest hardships. A few years afterwards Captain Sturt explored the courses of the rivers Darling and Murray. In 1844–5 Sturt, starting from the *Darling*, travelled north-west and north to the Grey Ranges, through great sand-

MOUNT SARMIENTO.

(*C. Darwin and Admiral R. Fitzroy's "Voyage of the 'Beagle,'"* 1839.)

ridges, mud-planes, and the spinifex which covers so much of the interior, to a point within 150 miles of the centre of the continent. Augustus Gregory commanded an expedition which in 1856 went by sea from Sydney, through Torres Straits, and landed on the banks of the Victoria river. Ascending this stream to its source, Gregory crossed the water-parting at a height of 1,660 feet above the sea, and descended a stream flowing south, which ended in a salt lake. Returning down the Victoria, he next advanced to the Gulf of Carpentaria, and explored the region on its eastern side, ending his labours at Brisbane. He had marched over 6,500 miles in a country previously unknown. Attempts to cross the continent from Adelaide continued to be made. M'Douall Stuart, in 1860, got within 245

miles of the northern shore. At length Richard O'Hara Burke, with his companions Wills and Gray, accomplished this arduous achievement, crossing the continent from south to north. But they nearly all perished; one man, named John King, alone surviving. In 1862, however, M'Douall Stuart, in a second attempt, successfully made the journey from Adelaide to Van Diemen Gulf on the north coast, along the route which has since been adopted for the electric telegraph (1872).

Queensland.

In 1843–6 Leichardt explored Queensland from the south to the Gulf of Carpentaria, crossing the Fitzroy river to the head of the gulf, whence he made his way westwards along the north coast as far as Port Essington. In 1845–58 the Queensland interior was still further explored, the Barcoo discovered, and other intermittent streams flowing towards Torrens, and other lakes by Mitchell, Kennedy, Gregory, and others.

West Australia.

In 1829 the colony of West Australia was founded, and the exploration of the continent began from that point. In 1857–60 great activity was shown in the exploration of the region around Torrens Lake, east and west, by such explorers as Swindon, Warburton, M'Douall Stuart, and others, during which other lakes and mountains were discovered, the physical features filled in with fresh accuracy, and the economical value of the country ascertained. The search expeditions that were sent out after Burke and Wills in 1861 and 1862 greatly extended our knowledge of the country. M'Kinley crossed the frontier twice. In South Australia he proceeded to the mouth of the Barcoo, the remarkable formation of which he was the first to make known. By a route a little to the east of that of Burke and Wills he reached the Gulf of Carpentaria, and on the return journey crossed through Queensland. The information obtained by all these expeditions on the physical geography and natural resources of the country was of substantial value. In 1860–74 much was done to obtain a better knowledge both of the back country of Queensland and of Western Australia, though the results of the latter were not encouraging to industry. The most energetic of these explorers were the brothers Forrest, especially John. We can only mention the expedition by John Forrest and Kennedy, in 1874, across the centre of the continent from west to east, and south to Adelaide. Other important names connected with the exploration of the interior are those of Giles and

MAP OF AUSTRALIA IN 1830 BY L. HEBERT.

Carmichael (1872), the Gosses (1873), Giles and Tietkens (1873–6). In 1873 Warburton made his famous journey from Alice Springs, on the telegraph line north-west and west to the west coast, between 20° S. and the tropic of Capricorn, revealing more strikingly than had been done before the terrible nature of the interior. In 1875–6 Giles crossed from Lake Torrens by Lake Moore to Perth, and recrossed from Perth by the Ashburton to the telegraph line. Between 1875 and 1885 expeditions were continually in the field, opening up the continent, and seeking for lands that might be turned to account for agricultural or mining purposes. In 1896, however, it might be said that about one-half of the continent was unexplored.

New Zealand.

The exploration of New Zealand has been mainly carried out by the well-organised Colonial survey, under Sir James Hector and the late Sir Julius Von Hoast. The coasts of New Zealand and the surrounding regions were fully surveyed by Captains Stokes and Byron-Drury, in the *Pandora* and *Acheron*, between 1848 and 1858. The adjacent island of New Guinea is only separated from Australia by Torres Strait, and its south-eastern portion has been partially explored and surveyed, first by British surveying ships, and in later times by missionaries and

Malaysia.

others. In the Malay Archipelago, also, English surveying vessels and English travellers have done much good work, the name of A. R. Wallace (p. 434) being intimately connected with this region.

The Pacific.

The work of exploration and survey by English navigators was continued after Cook's death (Vol. V., p. 307) with unabated vigour; and as each vessel had, as a rule, a naturalist on board, much good work was done for science. During the voyage of 1872–6 the *Challenger* visited many of the Pacific islands, with results to scientific geography of the first value.

Europe.

During the period under review Europe was overrun by British travellers, some few of them entitled to be regarded as explorers, especially in the field of physical geography. With the exploration of the great Alpine region and the investigation of its glaciers, the English Alpine Club has been intimately associated; and if we gave the names of all who have done something for Alpine topography and physical geography the list would be a long one. The Alpine Club map of Switzerland is an achievement worthy of record. The names both of J. D. Forbes and of Tyndall are intimately associated with the Alps,

MAP OF AUSTRALIA, SHOWING ROUTES OF EXPLORERS UP TO 1889.

not only for the light they threw on their topography, but also, and mainly, for their classical researches into glaciation. For a knowledge of the scientific aspect of the great Alpine groups John Ball did much. Forbes's researches on the glaciers of Norway, though not so extensive as in the case of Switzerland, were not of less scientific value. Murchison's investigations of

BREADFRUIT TREE, KI ISLAND, THE MOLUCCAS.

*(By permission, from a photograph supplied by the "Challenger" Office, Edinburgh.)*

the Ural Chain, and Murchison, Lyell, and Sedgwick's journeys in the volcanic region of Auvergne (p. 80), while mainly for geological purposes, yielded valuable results in physical geography; so have Lyell's investigations of the volcanic region of Sicily and of the coasts of Denmark. Some topographical work has been carried out in Greece and the Balkan Peninsula, both by private travellers and through the Hellenic Society.

The Ordnance Survey of the British Islands, initiated about the beginning of the century, was nearly completed by 1885. The Royal Geographical Society was founded in 1830, and during the period did much to promote exploration all over the world and to raise the standard of geography at home.

The Ocean Depths.

Deep-sea research (oceanography) may be said to have been initiated during the period under review, and to have culminated in the voyage of the *Challenger*, equipped by the British Government, which under Captain (now Admiral Sir George) Nares and the late Captain F. T. Thomson, from 1873 to 1876, ex-

A LAVA STREAM, KILAUEA, HAWAII.

*(By permission from a photograph supplied by the "Challenger" Office, Edinburgh.)*

tended research over the Atlantic and Pacific oceans, and added largely to our knowledge of the physical geography of the sea.

Greater Britain.

When Englishmen from the mother country visit the colonies and learn to appreciate the wealth and the prosperity of Greater Britain, they find it hard to realise that nearly all this vast and apparently stable empire has virtually been created within the last hundred years. When, to avenge the loss of Canada, France aided the American colonists to throw off the yoke of

George III., England as a colonial power sank low among the five European nations who strove for dominion beyond the seas. The Dutch had great possessions in Asia, at the Cape of Good Hope, and in South America; the Spaniards and the Portuguese held Mexico, Central America, and, with the exception of the country now known as Guiana, all South America also: the French owned Mauritius and many of the West Indies. The nucleus of colonies left to England, and on which she built up her second empire, consisted only of Gibraltar, Canada (at that time virtually bounded on the west by the Great Lakes), Jamaica, Barbadoes, and a few of the smaller West Indian islands, St. Helena, and some trading stations on the west coast of Africa.[1]

**Growth of the Empire.**

From these small beginnings has grown a world-wide empire; and now the larger half of North America, the whole of Australia, Tasmania, and New Zealand, vast territories in the south, the east, and the west of Africa, British Guiana, the Malay peninsula, innumerable islands, and priceless fortresses which command the highways of commerce, own allegiance to the British Crown. To describe in detail the various methods by which this extraordinary expansion has been effected would be here impossible, for the history of many of the colonies cannot be dissevered from that of our foreign policy. England emerged empty-handed from very few of the long series of wars which ended at Waterloo. Before the fall of Napoleon most, if not all, of the over-sea possessions of France and her allies had surrendered to our flag. At the Peace many were restored to their original owners, but Ceylon, Mauritius, Cape Colony, Trinidad, and Guiana were then permanently added to the British dominions. On the other hand, most of the great countries which are now known as the self-governing colonies were founded and developed by the restless energy of the Anglo-Saxon race. Thus in Ontario, the first province of British North America settled after the United States obtained their independence, the pioneers were Englishmen and Scots from the revolted colonies. These men, known in Canadian history as the "United Empire Loyalists," refused to throw in their lot with the young Republic, and, following the old flag into

[1 India does not come within the scope of this section.]

Canada, became backwoodsmen in Ontario. With indomitable energy, and strengthened by a considerable immigration from Scotland, they slowly and painfully converted their forest wilderness into the "garden of Canada": and their descendants have been the pioneers of the army of emigrants from Britain, who have now begun to people the prairies of Manitoba and the North-West, and, tunnelling through the Rocky Mountains, have joined hands with their fellow-Britons on the shores of the Pacific Ocean. Australia, Tasmania, and New Zealand have been entirely settled by emigrants from the mother country; and though many of the original settlers in Tasmania, New South Wales, and Western Australia were of undesirable material, hundreds of thousands of active, energetic English emigrants have now not only completely obliterated the convict taint, but have built up a second England in the Southern ocean. In South Africa, too, there has been a considerable influx of population from Great Britain. Besides these great colonies, which claim a nationality of their own though not independence, there are a number which possess representative government, the Crown retaining a veto on legislation; a number of Crown Colonies, governed by British officials (the British and native population, however, enjoying varying degrees of representation); and of Protectorates, which retain their native governments under British supervision The two last classes, like the Indian Empire, have developed in Britons a capacity for governing uncivilised races hitherto unparalleled in history.[1]

**Growth of Imperial Sentiment.**

It is difficult for this generation to believe that the pride and interest with which the mother country now regards the self-governing groups of colonies is quite of recent growth: harder still to realise that in the middle of the century British statesmen contemplated, and even sometimes hoped for, separation. Happily for England, although the Australians and Canadians were deeply wounded by this attitude of the Colonial Office, always unsympathetic and often insolent, they refused to "take the hint and cut the painter"; and thus by their pride of race, their common-sense, and their sturdy

[1 The colonial activity of foreign states, revived about the close of the period covered by this work, has caused a renewal of the "expansion of England" which lies beyond our scope here.]

patriotism, they preserved the British Empire from dismemberment. The English public were at that time so ignorant in all concerning the colonies that they were indifferent as to the continuance of the connection. They were unable to distinguish between the nationality of the inhabitants of British North America and the United States, and, to the intense disgust of the Canadians, used to speak of them as Yankees; while even the Colonial Office was known to address despatches to "Melbourne, South Australia, New South Wales," which in Europe would be equivalent to sending a letter to "Lisbon, Spain, France." But this is now a thing of the past; and British indifference to the fortunes of the colonies has given place, from about 1875 onwards, to keen pride in the Empire. An Imperial Federation League was founded in that year, under the auspices of statesmen of both political parties; the conferences of colonial statesmen in London at the Jubilees of the coronation of Queen Victoria in 1887 and 1897 have drawn the great self-governing colonies closer to the mother country, and opened up at least the possibility of a customs union; the aid given by Canadian *voyageurs* and New South Wales cavalry in 1885 to the mother country in the Soudan prepared the way for the more extensive and more needful support accorded to her by both Canada and Australia during the South African War in 1899–1902, and for the assumption by them of part of the burden of Imperial defence.[1] The Canadian colonies were federated in 1867, the Australian in 1900, the South African will follow in good time. The practical experiments of the Australian colonies and of New Zealand in state ownership of railways, in the simplification of the transfer of land, in the extension of the suffrage to women, in old age pension schemes, in payment of members, in laicising the State by disestablishment and

[1 In some degree, moreover, the Imperial connection was strengthened towards the end of our period by the change in the system of appointing Colonial Governors which began with the despatch of the Marquis of Lorne to Canada in 1878. Formerly they constituted almost a special profession, not unlike the provincial Governors of the Roman Empire. Now, at least in the great self-governing Colonies, they are men of high social and political position in England. Naturally they tend to carry more weight in the Colonies, and their experience on their return commands more attention from the British public than those of their more specialised but less eminent predecessors.]

THE ROYAL NAVAL DEPÔT, SYDNEY HARBOUR.

*(By permission, from a photograph supplied by the New South Wales Government.)*

unsectarian or secular education, in compulsory arbitration in labour disputes, are instructive attempts at solving some of the social problems which await treatment in the United Kingdom. The national devotion to sport has been frequently gratified by the visits of Australian cricket elevens to England, and of English elevens to Australia. The Colonial Procession at the Queen's Jubilee of 1897 brought vividly before the British public the extraordinary variety of the races and countries ruled by men of British birth. Improved steam communication, Imperial penny postage, and an all-British cable route to Australia, have helped to draw closer the bonds of the Empire. Whatever may be the form ultimately taken by the constitutional relations of Great and Greater Britain, it may be said with certainty that the indifference of a generation ago is ended for ever.

*Photo: London Stereoscopic Co.*

PORTION OF THE COLONIAL PROCESSION AT THE QUEEN'S JUBILEE, 1897.

## *AUTHORITIES.*—1865–85.

### GENERAL HISTORY.

Justin McCarthy, *History of Our Own Times;* Fyffe, *Modern Europe;* A. Debidour, *Histoire Diplomatique de l'Europe;* H. M. Stanley, *Coomassie and Magdala;* Winwood Reade, *Ashantee War;* Lord Roberts, *Forty-one Years in India;* C. G. Gordon, *Journals;* Wingate, *Mahdism and the Egyptian Soudan;* T. F. Carter, *History of the Boer War;* Sir Wemyss Reid, *Life of W. E. Forster;* A. Lang, *Life of Lord Iddesleigh;* Davidson and Benham, *Life of Archbishop Tait;* Ashwell and Wilberforce, *Life of Samuel Wilberforce;* Macdonnell, *Life of Archbishop Magee;* Hodder, *Life of Lord Shaftesbury;* Sir W. Hunter, *Life of Lord Mayo;* Lord Lytton, *Despatches;* Leslie Stephen, *Memoir of Henry Fawcett;* Lord Sherbrooke, *Autobiography;* G. Barnett Smith, *Life of W. E. Gladstone* and *Life and Speeches of John Bright;* Busch, *Our Chancellor;* Taxile Delorde, *Histoire du Second Empire* (6 vols., Paris, 1869–75); John Morley, *Life of W. E. Gladstone*, 1903; Lord Wolseley, *Story of a Soldier's Life* (his own), 1904.

### SPECIAL SUBJECTS.

*Law.*—*See* the Acts in the text referred to and the Acts amending them; *see also* Stephen's *Commentaries on the Laws of England* passim; Maitland, *Justice and Police* in the "English Citizen" Series; Fitzjames Stephen, *History of English Criminal Law*, *Law of Criminal Procedure*, and *Law of Evidence;* Pollock, *Land Laws* in the "English Citizen" Series; Williams, *Principles of the Law of Real Property;* Digby, *History of the Law of Real Property;* Pollock, *Law of Contract;* Anson, *Law of Contract;* Buckley, *The Companies Acts*, etc.

*The Army*, 1815–1885.—Marshall, *Military Miscellany;* *The Army Book;* Wrottesley, *Life of Sir John Burgoyne;* Gleig, *Life of Wellington;* Hamilton, *History of the Grenadier Guards;* *Camp and Barrack Room*, by a late Staff-Sergeant in the 13th Regt. (London, 1845); *Report of the Select Committee on the Army before Sebastopol*, 1854–55; Kinglake, *Crimea;* Wood, *The Crimea in 1854 and 1894;* Colin Campbell, *Letters from Camp during the Siege of Sebastopol* (with preface by Lord Wolseley); Stevens, *A Campaign with the Connaught Rangers;* *Historical Record of 30th Regiment;* Holden, *The Green Jacket*, in *United Service Magazine*, IV., N.S.; Hamley, *The Crimea;* W. H. Russell, *The Great War in the East;* Articles on *The English Soldier* by Colonel Knollys, in *Blackwood's Magazine*, 1895; Hamley, *The Operations of War;* Hume, *Précis of Modern Tactics*, revised by Pratt; Lord Wolseley, *Story of a Soldier's Life*, 1904.

*The Navy*, 1815–1885.—*The Nautical Magazine*, 1832–85; *The Navy List*, 1815–85 (for Admiralty orders, etc.); *The Queen's Regulations and Admiralty Instructions;* Papers read at the Royal Naval Exhibition, 1891; *The Naval Chronicle*, xxxiii–xl; Hans Busk, *The Navies of the World*, 1859; *Report of the United States Commissioner at the Paris Exhibition*, 1867; Lieutenant-Colonel Owen, R.A., *Modern Artillery* (1873); *Textbook of Gunnery* (1887); Laird Clowes, *History of the Royal Navy.*

*The Church*, 1815–1885.—It is difficult to select from the large mass of contemporary literature, but attention may be called to the following works:—Perry, *Student's History of the Church of England*, part iii.; Wakeman, *Introduction to the History of the Church of England;* Dean Church, *The Oxford Movement;* Liddon, *Life of Pusey;* Newman, *Apologia;* *Autobiography of Isaac Williams;* Coleridge, *Life of Keble;* Lock, *Life of Keble;* Gladstone, *Gleanings;* Mark Pattison, *Memoirs;* Smith, *Life of Bishop Heber;* Stanley, *Life of Arnold;* Prothero, *Life of Dean Stanley;* W. Ward, *William George Ward and the Oxford Movement;* Purcell, *Life of Manning;* Hare, *The Gurneys of Earlham;* *Life of Charles Lowder;* *Life of James Skinner;* *Life of A. H. Mackonochie;* Stephens's *Life of Dean Hook;* Churton's *Life of J. Watson;* *Life of Bishop Wilberforce.* For a severe Nonconformist criticism (the purely historical value of which is marred by a number of inaccuracies), *see* Dr. Rigg's *Oxford High Anglicanism.*

*Music.*—Sir G. Grove, *Life of Beethoven*; Dr. Hueffer, *Music in England under the Reign of Queen Victoria*; *Programmes of the Philharmonic Society*; C. Kenney, *Life of Balfe*; *Memoirs of Moscheles*; *Recollections of J. H. Mapleson.*

*Art.*—*See* chap. xxiii. *Philosophy.*—*See* chap. xxiii. *Literature.*—*See* chap. xxii.

*English Scholarship since* 1742.—Some account of the leading representatives of classical scholarship in England is given by Urlichs in Iwan Müller's *Handbuch*, i. 104–7, and by Bursian in his *Geschichte der classische Philologie*, pp. 1218–1227. On Porson, the principal authorities are his *Correspondence*, edited by H. R. Luard for the Cambridge Antiquarian Society (1867), and the *Lives* by Luard in *Cambridge Essays* (1857), J. S. Watson (1861), and Professor Jebb in *Dictionary of National Biography* (1896); on Parr, the *Memoirs* by Johnstone (1828); on Wakefield, his own *Memoirs* (1792–1804), and his *Correspondence with Fox* (1813); on Dobree, Burges, and Gaisford, Bake's *Scholica Hypomnemata*, pref. to vol. ii. (1839); on C. J. Blomfield, the *Life* by his son (1864); on E. V. Blomfield, an article in the *Museum Criticum*, ii. 520; on Samuel Butler, Mayor's *History of St. John's College, Cambridge*, pp. 898–964, and the *Life* by his grandson. There are articles in the *Journal of Philology* on Conington (ii. 334), Shilleto (vii. 163), W. G. Clark (viii. 173), Munro (xiv. 107), and W. H. Thompson (xv. 306); in the *Eagle* on Churchill Babington (xv. 362), Paley (366), T. S. Evans (477), Kennedy (448, 475), and Merivale (xviii. 183); and in Bursian's *Biographisches Jahrbuch* on W. G. Clark in 1879, George Long in 1880, Pattison and Badham in 1885, Blakesley, Munro, and Veitch in 1886, Paley, Kennedy, Babington, and Chandler in 1890, and Sellar in 1891. There are also articles on Kennedy in the *Classical Review*, iii. 226, 278. Pattison's *Memoirs* appeared in 1885; Jowett's *Life*, by Abbott and Campbell, in 1897. The best account of Sellar is by Mr. Andrew Lang, in Sellar's *Horace* (1892); of Nettleship in vol. ii. of his *Lectures and Essays* (1895). Grote's *Life* was published in 1873, and Thirlwall's *Letters* in 1881. Sir Charles Newton is the theme of an Address by Professor Jebb, published in *Journal of Hellenic Studies*, vol. xv. To the archæologists named on p. 668 may now be added Sir E. H. Bunbury (1812–95), the well-known numismatist and writer on ancient geography. Among Orientalists Cureton was the subject of an article in the *Times*, 30th June, reprinted as Appendix to Dean Stanley's Sermon of 19th June, 1864; there is a *Life* of Professor Lee (1896), an article on Professor J. Palmer in the *Journal of Philology*, vol. vii. 264, and a *Life* of Professor E. H. Palmer, by Besant (1883). There is also a notice of Alexander Hamilton (1765–1824) in Benfey's *Geschichte der Sprachwissenschaft*, p. 358; a *Life* of William Carey, by Marsham (1859), and also by G. Smith (ed. 2, 1888); and, lastly, a *Life* of Bryan Hodgson, by Sir W. W. Hunter (1896). For notices of other scholars, see *Dictionary of National Biography*; and for those of recent date, the successive editions of *Men of the Time.*

*Astronomy*, 1815–1885.—Grant, *History of Physical Astronomy*; A. M. Clerke, *Popular History of Astronomy during the Nineteenth Century*, and *The System of the Stars*; Proctor, *Saturn and its System*; Proctor and Ranyard, *The Old and New Astronomy*; Ranyard, *Observations made during Total Solar Eclipses*, forming vol. xli. of the Royal Astronomical Society's *Memoirs*; Young, *The Sun*; Gore, *The Visible Universe*; Sir R. Ball, *The Story of the Heavens*; Huggins, *Presidential Address at the Cardiff Meeting of the British Association*, 1891; Scheiner and Frost, *A Treatise on Astronomical Spectroscopy*; Young, *General Astronomy.*

*Geology and Medicine.*—*See* chap. xxi.

*Physics*, 1815–1885.—O. Lodge, *Pioneers of Science* (1893); Garnett, *Heroes of Science* (S.P.C.K., 1885); A. Guillemin, *Electricity and Magnetism*, translated and revised by S. P. Thompson, F.R.S. (1891); T. Preston, *Theory of Light* (1890); Arago, *Biographies of Distinguished Scientific Men* (London, 1857); *Memoirs of Sir Isaac Newton* (2 vols., London, 1855); Tyndall, *Heat a Mode of Motion*, and *Light and Sound*; Garnett, *Heat*; A. R. Wallace, *The Wonderful Century* (1898); Glazebrook, *Clerk Maxwell and Modern Physics*; Clerk Maxwell, *Collected Papers* (Camb.

Univ. Press); P. G. Tait, *Life of Sir W. R. Hamilton* and *Recent Advances in Physical Science;* Notices in the *Dictionary of National Biography, Encyclopædia Britannica,* Articles on Magnetism, Heat, Light, etc.; Cajori, *History of Physics,* 1899.

*Chemistry,* 1715-1885.—For fuller accounts of Price, Priestley, Boyle, Cavendish, etc., *see* the *Dictionary of National Biography.* Accounts of the various processes used by alchemists, and stories of transmutation, may be found in the *Bibliotheca Chemica Curiosa* of Mangetus, Stahl's *Fundamenta Chemiæ,* and Junker's *Conspectus Chemiæ.* There is no complete modern history of the science, but Kopp's *Geschichte* is one of the best, and Hoefer's *Histoire de la Chimie* is good. *See* also E. Meyer, *History of Chemistry,* trans. M'Gowan (incomplete as regards English and French work); *Reports* on the Exhibitions of 1851 and 1862, chemical sections; *Philosophical Magazine; Journal of the Chemical Society.*

*Medicine.—See* chap. xxi. For the history of medical journalism, *see* Sprigge, *Life and Times of Thomas Wakley,* 1897.

*Engineering to* 1885.—*Spon's Dictionary of Engineering* (1874); Rankine, *Civil Engineering* (ed. 1884); H. Law and D. Clark, *Civil Engineering* (1881); Galloway, *The Steam Engine and its Inventors;* Thurston, *The Steam Engine* (International Science Series); E. Clark, *The Britannia and Conway Tubular Bridges* (1880); J. Claxton Fidler, *Practical Treatise on Bridge Construction* (1887); Smiles, *Lives of the Engineers; Minutes* of the Proceedings of the Institution of Civil Engineers.

*Mining and Metallurgy.*—Percy, *The Metallurgy of Iron* (1864); Turner, *The Metallurgy of Iron* (1895); R. Nelson Boyd, *Coal Pits and Pitmen* (1892); Galloway, *History of Coal Mining* (1882); Hull, *The Coalfields of Great Britain* (1881); Meade, *Coal and Iron Industries of the United Kingdom* (1882); Jevons, *The Coal Question* (1866); *Coal, its History and its Uses* (by the Professors of the Yorkshire College, Leeds); W. E. Hunt, *British Mining; Journal of the Iron and Steel Institute,* especially the Presidential Address of Mr. David Dale (1895); *Reports* of the various Royal Commissions to which reference has been made in the text.

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# INDEX.


Aberdeen, Earl of, as Foreign Minister, 164, 165; his Ministry (1855), 348, 352
Abyssinian War (1868), 522, 569, 909
Adams, John Couch, 246
Adullamites (1866), 579
Æsthetic movement, 860
Afghanistan, exploration, 90; relations with (1841), 163, 174; war of 1873, 570; war of 1878, 531, 532; Penjdeh, 541
Africa, exploration of, 908—918
Africa, South, Kaffir wars, 174; Boer war (1880), 571; Zulu war, 571 *seq.*
African Steamship Company, 462
Agricultural labourers' unions, 820
Agriculture (1802—1832), 102—115; (1832—1846), 290—297; (1846—1865), 468—484; (1865—1885), 805—814; effect of French war on, 106; distress after 1815, 112; machinery, 108, 477; (1865—1885), 811—813; chemistry applied to, 262, 264, 292, 483, 484, 813; distress (1832—1836), 290 *seq.*; increase in product, 297; prosperity (1836—1876), 292; (1862—1872), 475; improvements, 476, 477; list of prominent agriculturists, 480 note; foreign competition, 806; decline of, 809; depression after 1879, 806 *seq.*, 814; in Scotland, 878 *seq.*; authorities, 151, 518
Ainsworth, W. H., 227
*Alabama* claims, 357, 525
*Alaska*, the, 463
Albert, Prince. *See* Prince Consort
Alford, Dean, 663
Allingham, Mrs., paintings by, 611
Alma-Tadema, Sir L., 615 *seq.*
Almack's, 132
Alpine Club, work in topography, 924
Althorp, Lord, his Budget (1833), 152
America, exploration of, 918—920
Ampère, André Marie, and electro-magnetism, 252; and telegraphy, 783
Anæsthetics introduced, 442
Anchor Line, 462
Anglicans (1815—1832), 29
Anglo-Saxon, study of, 674 *seq.*
Aniline dyes, 713 *seq.*
Animism, 680
Antarctic exploration, 899, 900
Anthropology, study of, 680
Anti-Corn Law League, 308
Archæology, classical, 666
Architects *c.* 1846, 393
Architecture (1815—1840), 234—239; domestic, in late 19th century, 634
Arctic exploration, 892 *seq.*
Armitage, E., 401
Armstrong guns, 574 *seq.*
Army, the (1815—1854), 166—174; (1854—1865), 360—370; (1865—1885), 557—573; retrenchment, 167; recruiting, 169; condition of soldiers, 169 171; liberty of worship introduced in (1859), 171; punishments, 172; shooting, 172; weapons, 172; in Crimean War, 360—368; in Persia and China, 369; Indian Mutiny, 370; Volunteer movement, 370; education in, 175, 560 *seq.*; camps, 562; barracks, 562; medical service, 445 *seq.*; abolition of purchase, 525, 560; Cardwell's reforms, 557 *seq.*; short service, 558; strength of, in 1885 and 1895, 559; position of Militia, 559; localised corps, 559; territorial system, 559; linked battalions, 560; reserves, 559 *seq.*, 564; Volunteers and Yeomanry, 564; care for the soldier, 369, 562 *seq.*; withdrawal from colonies, 565; tactics and weapons, 566; authorities, 933
Arnold, Matthew, poems of, 381—383
Arnold, Dr. Thomas, on the Church, 31; and the Broad Church movement, 190; scholarship of, 664 *seq.*
Art (1846—1865), 397—415; (1865—1885), 608—618; decorative, in 19th century, 618—639; "popularising" of, 635; domestic, in 1885, 639
Asia Minor, travel in, 904, 906, 907
Ashanti War (1873), 526, 570
Ashley, Lord. *See* Shaftesbury
Association of ideas, 413 *seq.*
Astronomy (1815—1846), 239—248; (1846—1885), 686—696; authorities, 934
Atlantic Cable, 787
Austen, Jane, 47
Australia, communication with, 457, 465, 466; military help from, 566; exploration of, 920—924; recent relations with Great Britain, 929—931
Austria, relations with, 344, 349, 352
Authorities: Astronomy, 934; Agriculture (1802—1846), 151; (1846—1885), 518; Army, 933; Art (1815—1846), 341; (1846—1885), 517; Biology, 517; Chemistry, 935; Church history, 933; Colonies, 936; Dress, 936; Economic history, 151; Education, 936; Electrical Science, 935; Exploration, 936; Free Churches, 341; Geology, 150; Greater Britain, 936; Ireland, 936; Law, 933; Literature, 150; Medicine, 150, 935; Mercantile Marine, 518; Mining and Metallurgy, 935; Music, 934; Navy, 933; Nonconformity, 341; Philosophy, 517; Physics, 934; Political History (1815—1832), 150; (1832—1846) 341; (1846—1865), 517; (1865—1885), 933; Pottery, 935; Prison discipline, 341, 936; Railways, 341; Scholarship, 934; Science, 150, 517, 934, 935; Scotland, 518; Shipping, 518; Textiles, 935

Badham, Charles, 655
Bailey, P. J., his "Festus," 210
Bailey, Samuel, 423
Baily, Francis, 240; his Beads, 245
Bain, Alexander, 675

Baker, Sir S., 912, 913
Balfe, M. W., 644, 645
Bank Charter Act (1844), 144, 311; suspensions of (1857), 498
Baptism, controversy on, 374
Baptists, 198
Barry, Sir Charles, 239
BATESON, MARY: Social life (1815—1832), 127—141; (1832—1846), 318—326; (1846—1865), 502—510; (1865—1885), 861—874; Postal reform, 326—333; Dress (1840—1885), 854—861; Education in England (1807—1885), 831—850
Baths, 871
Bazaars, 506
Beaconsfield, Lord. *See* Disraeli
BEAR, W. E.: The Vicissitudes of Agriculture (1846—1865), 468—488; Agriculture (1865—1885), 805—814
Beaumont, Sir George, 53
Bedchamber question, 160
Beddoes, T. L., 210
Bedford College, 844
Beke, Dr. C., 907, 909
Bell, Dr. A., and education, 831
Bell, Dr. Patrick, his reaper, 477, 878
Bennett, Sir Sterndale, 75, 640, 644
Bensly, R. L., 670
Benson, E. W., Archbishop of Canterbury, 596
Bentham, George, and botany, 424; and formal logic, 422
Bessemer steel process, 717, 745, 746
Bible: criticism, 669 *seq.*; Revised Version of the, 669; and science, 429, 436, 702
*Birkenhead*, the, 180
Black Sea Question (1871), 525
Blacking, 870
*Blackwood's Magazine*, 42
Blanketeers, 2
Bleaching, 800
Blessington, Marguerite Countess of, 134
Blomfield, C. T., afterwards Bishop of London, 653
Blomfield, E. V., 653
Blue Ribbon Army, 866
Boer War, 571
Boilers, steam, 730—734
Bonington, R. P., 67, 392
Bonnets, 858
BONNEY, T. G.: Geology (1815—1846), 76—86; Geology and palæontology (1846—1885), 696—704
Bonnymuir rising (1820), 142
Boole, George, and symbolic logic, 422
Bosworth, Joseph, 675
Botany, 423 *seq.*, 440
Bowles, W. Lisle, 38
Boycotting, 534
Bradlaugh, Charles, and Northampton election, 533; influence against Socialism, 827, 828
Breakfast, 134, 871
Brett, John, 610
Brickmaking, 778 *seq.*
Bridges, great modern, 738 *seq.*
Bright, John, and Corn Law agitation, 309; enters Ministry, 533
Bristol, reform riots at, 14
Britannia Bridge, 740
*Britannia*, the earliest Cunarder, 459
*Britannia* training-ship, the, 583
British and Foreign School Society, 831
British Association founded, 262
British Legion (1854), 156
British Museum, 136
Broad Church school, 375 *seq.*, 593
Brontë, Charlotte, and her sisters, novels of, 589 *seq.*
Brougham, Lord, political career of, 13, 153, 154, 157, 160; and primary education, 831
Brown, Ford Madox, 401, 413
BROWN, JOHN: The Free Churches (1815—1885), 196—209
Browning, Elizabeth Barrett, poems of, 380
Browning, Robert, poetry, 213, 214, 380, 602
Bruce, Right Hon. H. (Lord Aberdare), 525
Brummel, Beau, 128
Brunel, Isambard Kingdom, his ideas, 280
Brunel Marc Isambard, advocates steam in the Navy, 176
Buckland, W., 699, 700
Buckle, H. T., 423
Bulwer-Lytton, Sir E. H., first Lord Lytton, 227 *seq.*
Burial in towns prohibited, 267, 444
Burma, acquisition of, 174
Burne-Jones, Sir E., 612, 618, 636
Burton, Sir F., 615
Burton, Sir Richard, visit to Mecca, 908
Burton, W. S., 611
Buss, Miss F. M., 844
Butler, Samuel, afterwards Bishop of Lichfield, 653
Butt, Isaac, 532, 882
Butter, prices of (1839—1850), 474
Byron, H. J., 506
Byron, Lord, poetry of, 33—36

Cabs, 138
Caird, Sir James, and agriculture, 470, 471
Calderon, P. H., 615
Cambridge University: great scholars at (1742—1885), 647—658; reform at, 846—850
Cameron, Verney Lovett, 914
*Campania* and *Lucania*, 454
Canada, rebellions in and Lord Durham's ordinance, 159, 160; frontier question, 164; federation of, 522; military help from, 566; Red River expedition, 569; relations with England, 928
Canals, growth of traffic on, 274; the Manchester Ship Canal, 742
Cancer, 723
Canning, George, foreign policy of, 6; Ministry and death, 8
Capital punishment, 317, 318
Cardigan, Earl of, his duel, 324
Cardwell, Mr. (Lord Cardwell), Army reforms of, 524, 557 *seq.*
Carlyle, Thomas, works, 218—222; his place in literature, 223 *seq.*; "Life of Frederick the Great," 387
Carnarvon, Earl of, 530, 532
Caroline, Queen, 4, 6
Carpets in 1851, 628
Carriages (1820—1840), 138
Carrington, R. C., 687
Castlereagh, Lord, 3, 6
Catholics, emancipation of, 10, 12, 146; aggression, 590
Cato Street conspirators, 4
Cattle breeding and feeding, 482 *seq.*
Cattle disease, 488, 805, 807
Cavendish, Lord F., murdered, 537, 986
Celtic literature, 887—892
Central Criminal Court, 551 *seq.*
Chadwick, Sir Edwin, and State medicine, 267
*Challenger*, voyage of the, 700, 900, 924, 927
Chalmers, Thomas, 144; and the Disruption, 334; and poor relief, 337
Chambers, Robert, and the theory of evolution, 426

Chancery, Court of, 543, 546, 548
Chandler, H. W., 660
Charlotte, Princess, 3
Charterhouse in 1835, 840
Chartism, 158, 159; programme, 307; and trade unions, 304; and Corn Law agitation, 308; revival and collapse in 1848, 345, 490
Cheltenham College, 844
Chemical industry, growth of, 716—718
Chemical Society founded (1841), 262
Chemistry (1815—1832), 86—89; to 1846, 259—264; (1846—1865), 713—718
Chenery, Thomas, 671
Chester Castle, Fenian plot to seize, 520
Childers, H. C., First Lord of the Admiralty, 522, 533, 539
Children: dress of (1840), 319; in factories, 298—309; in coal mines, 749—752
China: wars, 165, 353; exploration in, 902, 904; study of Chinese, 672
China-clay, 765
Chloroform introduced, 443
Chobham, camp at (1853), 169
Cholera, 266, 445
Christian Socialists, 492, 496
Church, the (1815—1832), 26—32; (1832—1846), 182—196; (1846—1865), 373—378; 1865—1885), 590—596; of Scotland, 144, 344 *seq.*, 878; in Ireland, 148, 152, 522—523, 596, 881; relations with State (1832—1846), 182 *seq.*; Church rates, 158
Church, Richard, Dean of St. Paul's, 193, 194, 374, 591, 595
"Clapham Sect," the, 27
Clark, W. G., 657
Clergy, the English (1815—1832), 29
CLERKE, AGNES M.: Astronomy (1815—1846), 239—248; (1846—1885), 686—696
Clifford, W. K., 682
Clontarf meeting prohibited (1843), 339
CLOWES, SIR W. LAIRD: The Navy (1815—1832), 15—28; (1832—1846), 175—182; (1846—1865), 370—373; (1865—1885), 573—590; The Mercantile Marine, 448—468
Coaching, decay of, 284
Coal, energy from, 272; quantities got in 1801, 1854, and 1885, 749; duration of supply, 761, 762
Coal-mining (1846—1885), 749 *seq.*; methods of, 757; legislation on, 752 *seq.*
Coastguard, history of the, 588
Cobbett, William, 43, 129, 141; his "Advice to Young Men," 326; his *Weekly Register*, 508
Cobden, Richard, and Corn Law repeal, 163, 166, 309; moves vote of censure, 353
Cobden Treaty, 357, 499; its effect on use of wine, 865
Cochrane, Lord, in Chile and Brazil, 18
Codification, steps towards, 555 *seq.*
Coke, Thomas William, of Holkham, and agriculture, 108—112
Colenso, Bishop, 378
Coleridge, S. T., his "Christabel," 32; and the Oxford Movement, 189
Collins, Wilkie, 604
Collins, William, artist, 66, 396
Colonies, in 1815, 928; growth of 923 *seq.*; influence on England, 930; offer troops for South Africa (1881), 566; for Soudan (1885), 566
COLVILLE, JAMES: Scotland (1815—1832), 141—145; (1832—1846), 333—337; (1846—1865), 511—514; (1865—1885), 874
Combing machine, 795
Comfort, growth of, 868 *seq.*
Commercial depression after 1873, 827. *See* Foreign trade
Commercial treaties, 357, 499
Commoners, decay of, 103
Commons, enclosure of, legislation on, 554
Company law, 556
Composers, English musical, 644
Compound engine, 460, 464; *rationale* of the, 730
Comte, Auguste, and English thought, 681 *seq.*
Conciliation in labour disputes, 824
Congregationalists, 198
Conington, John, 662
Conservation of energy, 258, 686, 704, 711, 729
Constable, John, art of, 53—57, 392
Convocation restored, 184, 375, 378
Cooke, W. F., and telegraphy, 784
Cookery under George IV., 130 *seq.*
Cooper, Sir Astley, 93
Co-operation, Owen's efforts towards, 306; co-operative stores, 494 *seq.*, 818
Copeland's china, 770, 772, 773
Copper mining, 763, 764
Coprolites, 297
Copyhold enfranchisement, 554
Corn Law, 2, 118, 124, 308, 309, 468; effect of repeal on Ireland, 340
Coronations, cost of, 322
Cotton, consumption of, in England, 98, 102, 118; trade (1815—1830), 97; (1851—1865), 794, 796, 803; famine (1862—1863), 500, 796; its effect on public health, 445
County Courts, 549 *seq.*
Court of George IV., 127
Court, tone of, in early Victorian era, 320 *seq.*
Courts of law, changes in 19th century, 543—551
"Coventry town ribbon" (1851), 629
Cowper-Temple clause, 524
Cox, David, 71, 72, 397
Crane, Walter, 616
Crimean War, 343—352; Navy in the, 22; Army in, 360—368; effect on grain prices, 474
Criminal courts, 551 *seq.*
Criminal law, diminution of punishments 317, 318
Criminal Law Amendment Act (1871), 819
Criminal procedure, change in, 552
Crinoline, 856
Crisis, financial, of 1825, 122; of 1836—1837, 310, 311; of 1839, 311; of 1847, 488 *seq.*; its effect on agriculture, 470; of 1857, 497 *seq.*; of 1866, 815
Crofters, Scottish, 878 *seq.*
Cross, R. (Lord Cross), social legislation of, 528
Cross, T., 401, 404
Crystallography, 703
Crystal Palace concerts, 642, 643; Handel Festival, 646
Cunard line, 459, 512
Cuneiform inscriptions, 672
Cureton, William, 670
Currency, contraction of (1817—1821), 121
Cushman, Charlotte, 595
*Cutty Sark*, the, 449
Cyprus, occupation of, 530

Dairying, 474, 810, 813
Danby, Francis, 58—63
Dances under Regency and George IV., 134
Darby, John Nelson, 208
Darwin, Charles, and the theory of evolution, 426, 430 *seq.*; "Origin of Species," 435; later works, 438 *seq.*;

and geology, 698; in South America, 919
Davitt, Michael, and the Land League, 533
Davy, Sir Humphry, 86, 87, 249; his safety lamp, 87
Debt, the National, growth of, in the French wars, 115
Declaration of Paris, 352
De la Beche, H. T., 84, 86
Delft ware, 765, 766
De Morgan, A., and formal logic, 422
Denmark, relations with, 358
Dentistry, 724 *seq.*
De Quincey, Thomas, 38. 40, 41
Derby, Earl of (Lord Stanley), 152, 153; serves under Peel, 163, 166; Ministry of 1852, 347; second Ministry (1858), 356; third, 519
Derby, Earl of, son of the preceding and Foreign Secretary, 519, 522, 527, 529, 530
De Vere, Aubrey, 214
Deverell, W. H., 610
Dickens, Charles: works, 223 *seq.*; his art, 225; pathos and humour, 221, 226; later work of, 604
Dilettanti Society, services to Greek topography, 666
Diphtheria, 444, 723
Disestablishment of Irish Church, 520, 522, 596, 881
Disraeli, Benjamin (afterwards Earl of Beaconsfield), and "Young England," 308; Budget, 347; in second Derby Ministry, 356; in third, 519—521; becomes Prime Minister, 522; Ministry of 1874, 526; action in Russo-Turkish war, 530; and "a scientific frontier," 532; letter on Irish agitation to Duke of Marlborough, 533; death of, 534; novels, 230; importance of his "Lothair," 590
Dobell, Sydney, 384
Dobree, Peter Paul, 652 *seq.*
Dodwell, Edward, 668
Donaldson, J. W., 655
Dorchester labourers, unionist, transported (1834), 303
Doulton ware, 776 *seq.*
Drainage of land, 294 *seq.*, 476
Drama, the, 502 *seq.*, 608
Dress, under Regency and George IV., 128—130; in 1837—1840, 318, 319; (1840—1885), 854—861
Drinking and drunkenness from 1825, 861—867
Drummond, Henry, M.P., 206
Drummond, Thomas, 158
Duelling, decline of, 322
Dundonald. *See* Cochrane.
Durham, Earl of, in Grey Ministry, 12; and Canada, 160
Durham University, 846
Dyce, William, 231, 398
Dyeing, 513, 714
Dynamos, 789 *seq.*

Earthenware, 765, 772, 776
Eastern question, 348 *seq.*, 528 *seq.*
East India Company abolished, 356
Eastlake, Sir Charles, 230, 231
Economic history (1846—1865), 488—502. *See also* Social Economy
Edgeworth, Maria, 47
Education in England (1807—1885), 831—850; expenditure on, 837; statistics of, 838; in Scotland, 874; in Ireland, 146, 148, 882; agricultural, 813, 814; medical, 90, 93, 719; naval, 581—584, 585 *seq.*

EDWARDS, H. SUTHERLAND: Music and Society (1815—1832), 72—75; Music since the Georgian Era, 639—647
Egypt: purchase of Suez Canal shares, 528; England in (1882—1885), 538, 539; campaign of 1882, 572 *seq.*
Elections, General: (1857), 353; (1859), 356; (1866), 519; (1868), 522; (1874), 526; (1880), 533; (1885), 542
Electricity, in early 19th century, 248—255; application of, 783—792; telegraphy, 783—788; telephony, 788; cells and batteries, 789; dynamos, 789; motors, 790; voltaic arc, 790; lighting, 791, 792
Electrolysis, Davy's use of, 249; development of, 261
Electroplating and electrotyping, 792
Elements, attempts to classify the, 715
Elgin marbles, 400, 666; effect on architecture, 236
Eliot, George, 390 *seq.*, 604
Elliott, Ebenezer, 214
Ellis, A. J., 674
Empire, the British, review of, 927—932
Employers' liability, 557
Enclosure of land, its effects, 102, 103
Encke's comet, 242
Engineering, mechanical, 729 *seq.*; civil, 737 *seq.*
Engines: steam, 274, 276, 283, 289, 460, 734, 736; marine, 464, 730, 877; gas and oil, 736
Engravers, *c.* 1846, 394
Essayists, 42, 599
"Essays and Reviews," 376
Ethics, 414, 420, 685
Eton in 1835, 840
Etty, William, 68—70, 396, 397
Euphrates expedition, the, 906
Evangelical School, the, 26, 27, 30; decline of, 593
Evolution, theory of, 426 *seq.*, 678 *seq.*
Executions, public, abolished, 318
Exhibition of 1851, 621, 625 *seq.*; effect of on cotton trade, 102; pottery at, 772
Exhibition of 1862, 621, 634; pottery at, 774
Exploration, 892—927
Eyre, E. J., as explorer, 921

Factory legislation, 163, 164, 298—300, 491, 824
Faed, T., 615
Fallows, Fearon, 242
Faraday, Michael, begins career, 86; chemical work of, 89; work in physics, 254—257; and the mathematical physicists, 708
FARRER, LORD: The Railway System, 273—290
Fawcett, Henry, M.P., 526
Fellows, Sir Charles, 668, 907
Fenian agitation, 520; outrages, 880, 881
Ferrier, Dr. D., and cerebral function, 682
Ferrier, J. F., 423
Fielding, Copley, 71
Fildes, L., 616
Finance of Huskisson, 121 *seq*; of Peel, 310; of 1853—1860, 499
Fireclay goods, 781
First Offenders Act, 854
Food and feeding, 871 *seq.*
Forbes, J. D., 699
Forster, W. E., as Irish Secretary, 533—535, 886
Forth Bridge, 740 *seq*
France, relations with, 162, 163, 164, 168, 357

Frankland, Sir E., 706, 714
Franklin, Sir John, 892, 893, 895
Free trade: Peel's Budgets (1842, 1843), 163; (1845), 166; (1846) *ibid.*; his conversion, 310; effect on agriculture, 468; completion of, 498 *seq.*; and Scotland, 336
Frere, J. Hookham, 657
Friendly societies, 816—818
Frith, W. P., 406
Froude, J. A., his "History of England," 387
Froude, R. H., and the Oxford Movement, 186
Fry, Mrs. Elizabeth, in Newgate, 28
Furniture in 1851, 631 *seq.*
Fynes Clinton, Henry, 664

Gaelic. *See* Celtic
Gaisford, Thomas, Dean of Christ Church, works of, 660
Galton, Francis, 438, 682
Galway Line to America, 462
Gas engines, 736
Gas lighting in Scotland, 145
Gaskell, Mrs., as novelist, 390
Geology (1815—1846), 76—86; schools of, 76; early English geologists, 77 *seq.*, 84; geological survey, 84; geological museum, 86; (1846—1865), 696—704; palæontology, 696 *seq.*; effect of Darwinism, 698; glacial theories, 699 *seq.*; antiquity of man, 700 *seq.*; petrology, 702; mineralogy, 703; geological exploration, 926
George III., death of, 3; and agriculture, 107
George IV., regency, and Queen Caroline, 6; death of, 12; visit to Edinburgh, 142; coronation, 322
George, Henry, effect of his "Progress and Poverty," 827
Germ theory of disease, 707
Gilbert, Sir Henry, 264
Gilbert, Sir John, 614
Gilbert, W. S., 647
Gilchrist-Thomas process, the, 747
Gill, Sir David, 693 *seq.*
Girls, education of, 842—845
Gladstone, W. E.: resigns during Maynooth agitation, 164; opposes Ecclesiastical Titles Bill, 185; speech on Cheap Trains Act, 285; speech against Disraeli's Budget, 347; first Budget, 348, 498 *seq.*: Budgets (1859—1865), 358; Ministry of 1868, 522; retires from Liberal leadership, 528; Bulgarian atrocities, 529; Ministry (1880), 533 *seq.*; third Ministry, 542; Church views of, 591
Glasgow, improvement of harbour, 877
Glass, stained, in 1851, 632
Goderich, Lord, 7, 8
Gold discoveries, effect of, 500
Goldsmith's work in 1851, 632
Good, T. S., 66
Gordon, General Charles George: sent to Khartoum, 538; death, 540; work in exploration, 913
Gorham case, 374
Gothic revival, 238, 623; effect on furniture, 622 *seq.*
Graham, Sir James, Factory Act, 164
Graham, Thomas, chemist, 261, 262
Grain, prices of (1865—1879), 805
Grammar schools, 841 *seq.*
Granville, Earl, 356; as Foreign Secretary, 525
*Great Eastern*, the, 453 *seq.*
*Great Western*, the, 452
Greater Britain, 927—932
Greece, relations with, 8, 10, 346; historians of, 386, 663
Green, T. H., and the neo-Hegelian reaction, 683, 685
GRETTON, G. LE M.: The Army (1815—1854), 166—174; (to 1865), 360—370; (1865—1885), 557—573
Grey, Earl, Ministries of, 12 *seq.*, 153
GRIFFITHS, ARTHUR: Prison Discipline and Reform (1815—1846), 314—318; (1846—1885), 850—854
Grote, George, works of, 386, 663
Guano, 476
*Guardian*, the, 374
Guest, E., 674
Guion Line, 463
Guns, naval, 372, 573 *seq.*; quick-firing, 578

Hair-dressing, 130, 858, 859
Hamilton, Sir William, philosophy of, 414 *seq.*; and quantification of the predicate, 422
Hamilton, Sir W. Rowan, 258
Hampden, Dr. (afterwards Bishop of Hereford), 191
Harcourt, Sir W., 525; Home Secretary, 533; and Public Worship Act, 528
Hartington, Marquis of (afterwards Duke of Devonshire), Liberal leader, 528; Secretary for India, 533
Hartley Colliery accident, 753 *seq.*
Haydon, B. R., 48
Hazlitt, William, 42
Hebrew scholarship, 670
Heilmann's combing machine, 793, 802
Herschel, Sir John, and astronomy, 243 *seq.*; contributions to logic, 416
High Church party, in early 19th century, 29; movement (1841—1885), 590—593
Hill, Rowland, and postal reform, 158, 326
Hilton, William, 48
Hind, J. R., 692
Hodgson, B. H., 673
Hodgson, Shadworth, 684
Hofmann, A. W., chemist, 263
Holden, H. A., 658
Holland, Lady, 134
Holy Alliance, 3, 6
Home life, 873
Home Rule, Irish, 882
Hong Kong acquired, 163
Hood, Thomas, poems of, 210
Hook, Dr. Walter Farquhar (afterwards Dean of Chichester), 191, 196
Hook, J. C., 610
Hooker, Sir J. D., 425; and Darwinism, 434, 435
Hooker, Sir W., 424, 425
House of Lords, as a law court, 544, 546
Huggins, Sir W., 690—692
Hughes, Arthur, 610
HUGHES, REGINALD: Painting (1815—1832), 48—72; The Development of Painting, 230 *seq.*; Architecture (1815—1840), 234
Hughes, Thomas, 593
Hunt, A. W., 610
Hunt, Leigh, 43
Hunt, Sir W. Holman, 411, 636
Hunt, William, 397, 399
Huskisson, William, financial reforms of, 8, 121, 122; death, 12
Hutton, Dr. James, geologist, 76
HUTTON, W. H.: The Church (1815—1832), 26—32; (1832—1846), 182—196; (1846—1865), 373—378; (1865—1885), 590—596
Huxley, T. H., 696, 698
Hyde Park, Reform League in, 519
Hygiene, progress of (1865—1885), 722

Income tax, 115, 152, 163, 310
India, affairs of (1814—1835), 7; under Lord Dalhousie, 347; civil service opened, 348; mutiny, 353—356, 369, 370; passes from Company to Crown, 356; under Lord Mayo and Lord Northbrook, 526; famines, 526; garrison of, 557; survey and exploration of, 905, 909, 900—902
Independents, 197 *seq.*
Industrial revolution, effects of, 115, 268
*Inflexible*, the, 574
Ireland: (1815—1832), 145—149; (1832—1846), 337—340; (1846—1865), 514—516; (1865—1885), 880—887; Reform Bill (1832), 15; Catholic emancipation, 146; education, 146, 526; tithe war, 148; "Young Ireland" movement, 164; O'Connell and "Catholic rent," 146; his trial, 339; famine, 166, 339—340, 343; rising of 1848, 346; agriculture in, 487; Church disestablishment (1868—1869), 520, 522, 596, 881; land war (1846—1865), 515; land question (1865—1885), 881—885; Land Act (1870), 523 *seq.*; Invincibles, 537; Land Purchase Acts, 540, 814; Home Rule agitation, 532 *seq.*; Kilmainham Treaty, 537; University Bill (1873), 526; linen manufacture in, 797, 798; creameries in 811; language, 887
Iron trade, 270 *seq.*; 744 *seq.*
Iron, use of, in shipbuilding, 177 *seq.*; ironclad ships, 371 *seq.*, 512
Irving, Edward, 204
Irvingites, 204, 206

Jackson, Dr. Hughlings, 682
Jacquard loom, 98, 99
James, G. P. R., 227
Japan, artistic influence of, 638; exploration in, 903
JENKINS, H. C.: Mining and Metallurgy (1815—1846), 267—273; (1846—1885), 744—764
Jevons, W. S., and logic, 423
Jewellery in 1851, 632
Jews admitted to Parliament, 356
Johnston, A. K., explorer, 915
JONES, O. G. (the late): Engineering (1815—1855), 729—744
Jones, Sir William, 672
Joule, James Prescott, 258 *seq.*
Jowett, Benjamin, 376, 594, 660
JOYCE, P. W.: Ireland (1815—1832), 145—149; (1832—1846), 337—340; (1846—1865), 514—516; (1865—1885), 880—887; Celtic Scholarship, 887—892
Judges of High Court, position of, 547
Judicature Act, 526, 544 *seq.*
Judicial Committee of Privy Council, 376, 548 *seq.*
Jute trade, 800

Kaffir wars, 174
Kean, Edmund, 503
Keats, John, poetry of, 33, 37 *seq.*
Keble, John, sermon on "National Apostasy" (1833), 186; and the Oxford Movement, 186—194; influence, 373
Kekulé, A. W., and benzene, 714
KELTIE, J. S.: Exploration (1815—1885), 892—927
Kelvin, Lord, and the sun's age, 686; work of, 711 *seq.*; and telegraphy, 788
Kemble, Charles, 503
Kemble, Fanny, 503, 843
Kemble, J. M., 674
Kew Gardens, 425
Kilmainham Treaty, the, 537
Kilsby Tunnel, the, 738
King's College, 92, 845
Kingsley, Charles, 391, 492; as Broad Churchman, 593; later work of, 604
Kingsley, Henry, 391
Knowles, Sheridan, dramas of, 608
Knox, Alexander, 28

Labour laws, 556, 825 *seq.* *See also* Trade Unions
Labour M.P.'s, 820
Labourers, effect of enclosure on, 103; condition of, in the French War, 116; in 1815—1832, 117 *seq.*; in 1850, 471; improvement to 1885, 830
Laird, John, and iron shipbuilding, 177
Lamb, Charles, 39
Lamoureux, M., concerts of, 643
Lancashire cotton famine, 500, 796
Lancaster, Joseph, and education, 831
*Lancet*, the, early history of, 728
Land: prices and rent, 106—108, 116, 471—475, 807; cultivation, 108 *seq.*, 294 *seq.*, 476; land law reform, 553 *seq.*; nationalisation movement, 120, 827; Irish, 515, 523, 814, 881 *seq.*
Landon, Letitia Elizabeth, 211
Landor, W. S., 38, 39
Landseer, Sir Edwin, 232, 406
Law Courts, after Judicature Act, 545; of Counties Palatine, 546; County Courts, 550; criminal, 551 *seq.*; Court for Crown Cases Reserved, 552
Law, reform of, in 19th century, 542 *seq.*
Lawes, Sir John, 264, 483
Layard, Sir A. H., exploration of Nineveh, 668; of Syria, 908
Leake, W. M., 668
Lectures, popular, 134
Leighton, Lord, 614, 618
Leslie, C. R., 64, 65, 394
Lever, Charles, 229
Lewes, George Henry, 390, 681 *seq.*
Lewis, J. F., 397, 398
Lewis, Sir G. C., Chancellor of the Exchequer, 352; as classical scholar, 665
Licences, publicans', 862, 866
Liebig, Justus von, and agricultural chemistry, 262
Light, theories of, 250
Lightfoot, J. B., Bishop of Durham, 595; on the Greek Testament, 668
Lighthouses and lightships, 466 *seq.*; electric light in, 791 *seq.*
Limited Liability Act (1862), 498, 815
Lincolnshire in early 18th century, 131
Lindley, John, 424, 484
Linen trade, the (1851—1885), 796—798
Linnell, John, 57, 58, 406
Linton, Sir J., 616
Lister, Sir J., afterwards Lord Lister, 721
Lister, S. C. (Lord Masham), 802
Liston, Robert, surgeon, 444
Literary society, 133, 134
Literature (1815—1832), 32—43; (1832—1846), 209—230; (1846—1865), 378—392; retrospect (1815—1885), 596—608; Celtic, 887—892
Liverpool and Manchester Railway, 274, 276, 278
Liverpool, Lord, Ministry of, 2—8; his death, 8
Livingstone, David, 910, 914, 915
Local Government Board established, 722
Lockhart, John Gibson, 42
Lockyer, Sir Norman, 690
Locomotives, early, 274, 276
Logic of Mill, 415—418; symbolic, 422; Hegelian, 684

London, growth of, 134, 135; Thames Embankment, 136; parks, 136; bridges, 136, 138; markets, 138; police, 139—141; water supply of, 744; and the country, 873
London University, 845
Long, George, 665
Lowe, R. (Lord Sherbrooke), in Cave of Adullam, 519; Chancellor of the Exchequer, 522, 525; and Royal Titles Act, 528; and education, 835
Lunacy, treatment of, 723
Lunar theory, 686
Lustre ware, 768
Lyell, Sir Charles, geologist, 79, 80; and Darwinism, 434, 435
Lytton, Robert, Lord, poems of, 384; Viceroy of India, 551
Lytton, Sir E. H. Bulwer. *See* Bulwer

Macaulay, T. B. (afterwards Lord Macaulay), and the Indian Code, 7; "Essays," 215; "Lays," 216; "History of England," 216, 386; influence on prose, 217 *seq.*; defeats Sadler for Leeds, 299
Macfarren, G. A., composer, 75, 644
Macintosh, Charles, 514, 861
Maclear, Sir Thomas, 242
McClintock, Sir Leopold, 896, 898
McLennan, J. F., 680
Maclise, Daniel, 231, 396, 397, 401, 406
Macready, W. C., 503
Magazines and literature, 41, 42, 44
Magee, W. C., Archbishop of York, 522, 596
Maine, Sir H. J. S., 666
Majolica ware, 765, 772, 773
Majuba Hill, battle of, 537
Malcolm, Sir John, 671
Manchester, Fenian outrage at, 520
Manchester Ship Canal, 742
Manning, H. E., Archdeacon (afterwards Cardinal), secedes to Rome, 374; in Roman Church, 590
Manners. *See* Social Life
Manns, Sir August, 542
Mansel, H. L., Dean of St. Paul's, logic and philosophy of, 421 *seq.*
Manuring, improvement of, 296, 476
Maori war (1865), 569
Marks, H. S., 615
Married Women's Property Act (1882), 555
Marryat, Captain Frederick, 228
Martin, John, 60, 62, 396
Martineau, Harriet, soirées of, 134
Martineau, James, 377, 685
Matches, lucifer, 869 *seq.*
Mathew, Father, 337 *seq.*, 866
Maudsley, Dr. H., 682
Maurice, F. D., 593
Maxwell, James Clerk, 258; and Saturn's rings, 686; formula of the conservation of energy, 704; work of, 708—711
Maynooth grant, 164
Meagher, T. F., 514
Mechanics' Institutes, 838
Mechi, J. J., 480 *seq.*
Medicine (1815—1832), 89—95; (1846—1865), 440 *seq.*; (1865—1885), 718—723; the profession, 89, 719, 728; specialism in, 94; education (1815—1832), 90, 93; at the present day, 719; journalism, 726 *seq.*
*Megæra*, the, 180
Melbourne, Lord, 8, 13; becomes Prime Minister, 153; dismissed, 154; second Ministry, 157; view of changes at court, 320
Merchant shipping, 448—468; legislation on, 528, 556, 825
Meredith Owen, 384
Merivale, Charles, Dean of Ely, 666
Metallurgy (1815—1846), 267—272; minor industries, 763
Methodist New Connexion, 200, 201
Mexico, relations with, 357
Microphone, the, 788
Militia revived (1851), 168; in Crimean war, 368; after Mr. Cardwell's reforms, 559, 564
Mill, James, philosophical works of, 413
Mill, John Stuart, philosophy and logic of, 415 *seq.*
Mill, W. H., 670
Millais, Sir J., 404, 408, 410, 411, 618
Miller, Hugh, 84
Milman, H. H., Dean of St. Paul's, 326
Mimicry, animal, 440
Miners, condition of, 312 *seq.*; 750, 762
Mines, regulation of labour in, 312 *seq.*; inspection of, 752; accidents in, 752, 754, 755; ventilation of, 757 *seq.*; pumping in, 758; haulage in, 760
Minton's china, 770, 772, 773
Mitchell, T., 657
Mitford, William, 663
Money orders, postal, 330
Monk, James, Henry, 653
MONTAGUE, F. C.: Law Reform (1800—1885), 542—557
Moore, Henry, 610, 614
Moravians, 203
*Morning Chronicle*, 509
*Morning Post*, 510
Morocco, exploration of, 918
MORRIS, MAY: Decorative Art (1300—1885), 616—639
Morris, Richard, 674
Morris, William, poetry of, 383; and decorative art, 636
Mulready, William, 64, 390, 403, 406; his envelope, 331 *seq.*
Municipal reform, 157; in Scotland, 33
Municipal Socialism, 828
Munro, H. A. J., 662
Murchison, Sir Roderick, 81—83
Munro, William, 664
Murray, David, 616
Music (1815—1832), 72—75; (1830—1885), 639—647

Napier, Robert, 145
Nares, Sir George, 898, 927
National Gallery, 136
National Society (for education), 831
Natural selection, 432 *seq.*
Navarino, battle of, 9
Navigation laws, modified (1823), 8, 121; abolished (1847), 491
Navy, the (1815—1832), 15—28; (1832—1846), 175—182; (1846—1865), 370 *seq.*; (1865—1885), 573—590; reductions in (1815—1818), 15—17; promotion and retirement in, 19—21; rating of ships in, 22—26; shipbuilding improvements, 175, 176; iron steamers, 177—182; in Crimean war, 350; armour, 371—373; ordnance, 574 *seq.*; quickfiring guns, 578; torpedoes, 578; improvements in material and machinery, 580; signalling, 580; entry and education of officers, 581—584, 585 *seq.*; of seamen, 584—585; reserves, 588 *seq.*; strength of, in 1885 and 1904, 589, 590
Neale, E. V., 496
Nebulæ, 247, 695
Neptune, discovery of the planet, 246
Netley Hospital, 446
Nettleship, Henry, 662

Newman, John Henry, afterwards Cardinal, 186, 187, 191—193
Newport (Mon.), Chartist riot at (1839), 159, 311
Newspapers, 120, 143, 508—510; stamp duty on, 508; medical, 728
Newton, Sir Charles, 668
Newton, G. S., 65, 66, 396
New Zealand, war in, 569; exploration of, 924
Niger regions, 913, 914
Nightingale, Florence, 350, 366
Nile, discovery of the Great Lakes, 912 *seq.*
Nonconformists: repeal of Test and Corporations Acts, 10; marriage of, 158; progress of, 196—209
Normal schools, 834
Northcote, Sir Stafford, made Earl of Iddesleigh, 540
North London Collegiate School for Girls, 844
North-west Passage, the, 895
Nottingham University College, 828
Novelists, 44—48, 387, 598—600, 604—608
Nursing of the sick, 726

Oakes, J. W., 610
O'Brien, William Smith, 346, 514
O'Connell, Daniel, wins Clare election, 10, 146; and repeal, 12, 13; indicted for conspiracy, 164, 339; death, 164
O'Connor, Feargus, 159, 307
O'Curry, Eugene, 888 *seq.*
O'Donovan, John, 888
Odontological Society, 725 *seq.*
Oersted, Hans Christian, researches in magnetism, 251; and telegraphy, 783
Ohm's law, 253
Oil, use of mineral, 870; oil engines, 736
Omnibuses, 138
Open-field system, decay of, 102 *seq.*
Opera in England (1815—1832), 73, 75, 132, 644—646
Ordnance, naval, 573—578
Ordnance Survey, 926
Oriental scholarship in England, 670—674
Orsini's Conspiracy, 353
Ouseley, Sir W., and Sir G., 672
Overend-Gurney failure, 815
Overland route to India, 457 *seq.*
Owen, Sir Richard, and Darwinism, 426, 436; service to palæontology, 696
Owen, Robert, life, 305 *seq.*; and trade unions, 303 *seq.*; communism, 305 *seq.*
Oxford Movement, the, 30, 186—190, 593
Oxford University, reforms at, 846—850

Pacific, steamship lines in, 460, 466
Painting (1815—1832), 48—72; (1832—1846), 230—234; (1846—1865), 392—413; (1865—1885), 608—618
Palestine Exploration Fund, 908
Paley, F. A., 656
Palgrave, W. G., in Arabia, 908
Palmer, E. H., 671
Palmer, John, 670
Palmer, Samuel, 397
Palmer, William, divine, 32, 186
Palmerston, Lord, as Foreign Minister (1832—1834), 156; (1846—1852), 344—346; Home Secretary, 348; first Ministry, 352, 353; second Ministry, 356; death of, 360
Pangenesis, 438 *and note*
Panics, financial. *See* Crises
Paper duties question, 359
Paraffin oil, Scottish, 513
Parcel post, 331
Parian ware, 768
Parliament, Houses of, 238, 239
Parliamentary reporting, 510
Parliamentary trains, 255
Parnell, C. S., 532, 534, 686
Parr, Samuel, 651
Pathology, 95
Pattison, Mark, and the Oxford Movement, 376; works of, 660
Pauperism, in 1833, 154, 300 *seq.*; (1860—1863), 500
Peel, General, War Minister, 519
Peel, Sir Robert, Home Secretary, 6, 8; and Catholic emancipation, 10; becomes Prime Minister (1834), 156; second Ministry (1842), 163—166; on railway regulation, 288; corn law, 310; reform of Customs, 319; and Prince Albert's household, 320
Penal servitude, 850
Pengelly, William, 701
Peninsular and Oriental Steamship Company, 456 *seq.*
Persia, war with, 353; exploration, 904
Peterloo massacre, 3, 126
Petrie, Dr. George, 889
Petroleum, 870; engines, 736
Petty Sessions, 551
Phelps, Samuel, 505
Philanthropy, 28
Philharmonic Society, 639—641; the New, 642
Phillip, John, 615
Philosophy (1846—1865), 413—423
Philpotts, Henry, Bishop of Exeter, 374
Phœnix Park murders, 537, 886
Photography, early, 715; in astronomy, 689 *seq.*
Place, Francis, 124
Playfair, Dr. John, geologist, 76 *seq.*
Plimsoll, S., M.P., 825
Plymouth Brethren, 206 *seq.*
Poetry (1815—1822), 597; (1822—1837), 598; (1837—1885), 602 *seq.*
Polar exploration, 892—900
Police Courts, 551
Police of London, 139—141; of the country, 141
Polytechnics, 838
Pond, John, Astronomer-Royal, 240
Poor Law of 1834, 300—303; effect of, 292
Population (1815), 115; (1832), 127; of London, 134, 135; increase (1865—1885), 828 *seq.*
Porson, Richard, 647—651
Portugal, relations with, 7, 12, 156, 344
Postage stamps, 331 *seq.*
Post Office, reform of, 326—333
Potato: disease, 468; famine in Scotland, 511; in Ireland, effects of, 514
Potichomania, 506
Pottery (1815—1885), 764 *seq.*; art of (1851), 630; in 1862, 634
Power, D'Arcy: Medicine and Surgery (1815—1832), 89—95; Public Health (1815—1846), 264—267; Medicine and Surgery (1846—1865), 440—448; Medicine and Public Health (1865—1885), 718—728
Power looms, 97, 98; in linen trade, 797, 800, 801
Poynter, Sir E., 615
Preraphaelitism, 383, 397, 408, 636
Presbyterians, 196 *seq.*
Primitive Methodists, 202
Prince Consort: his marriage, 320; proposes court of honour, 324; death of, 360
Prison management, 28, 314—318, 850—854
Privateering abolished, 352

Prose, 38 *seq.*, 215—220, 385—392, 593—600; decline (1862—1880), 604, 605; revival after 1880, 607 *seq.*
PROTHERO, R. E.: Agriculture (1802—1832), 102—115; (1832—1846), 290—297
Prout, Samuel, 62
Prout, William, and chemistry, 88
Psychology, study of, 675, 678, 682 *seq.*
Public health (1846—1865), 44 *seq.*; (1865—1885), 722 *seq.*; (Scotland), 876; legislation on, 267
Public-houses, 862
Public Prosecutor, 552
Public schools, reform of, 840—842
Pugin, A. W., 623, 624, 771
Pugin, E. Welby, 238
Purchase in the Army abolished, 524, 560
Puritanism of the 19th and 17th centuries compared, 326
Pusey, Dr. E. B.: on Church prospects in 1832, 30; on cathedrals, 184; and the Oxford Movement, 188, 192, 194, 373; on Darwinism, 436; as Hebrew scholar, 670

Quakers (Friends), 203; and prison reform, 315
Quarter Sessions, 551
Queen's College, London, 844

Rachel, Mademoiselle, actress, 505
Radicals, 120, 124, 507; Scottish, 142
Railways, history of, 290; English, 273; railway commissions, 289, 290; speculation of 1836 and 1845, 284, 311; State purchase of, 285, 288, 290; growth of traffic, 286; Scottish, 336, 337, 880
Ramsay, A., and glacial action, 700
Ramsay, William, 663
Rawlinson, Sir Henry, 672, 904, 905
Reade, Charles, 392
Reaping machines, 477, 478
Rechabites, 866
Redhouse, Sir J. W., 671
Red River Expedition (1870), 569
Reform, parliamentary, agitation of 1831—1832, 13—15, 126; in Scotland, 142 *seq.*; and the Church, 30; in Ireland, 148; effect of Act in Scotland, 333; Disraeli's Bill (1859), 356; Earl Russell's, 358; of 1866, 519; of 1867, 519, 520; of 1885, 537
Regent Street, 135
Registration of births, deaths, and marriages begins (1837), 266
Registration of title, 554
Religion, theories of its origin, 679
Repeal of the Union, agitation for, 338
Revised Code, the, 835
Rham, W. L., 434
RHODES, W. G.: Physics (1800—1846), 248—259; (1846—1885), 704—713; Application of Electricity, 783—792
Richter concerts, 542 *seq.*
RIDDELL, H.: Textile Industries (1815—1851), 95—102; (1851—1885), 793—805
Rifles, 172
Rinderpest, 444, 488
Ring-spinning, 793 *seq.*
Ristori, Madame, 505
Ritualism, 591
Rivière, Briton, 616
Roberts, David, 62, 63
Roberts, Lord, in Afghan war, 532
Roberts, Richard, and his "mule," 100
Robertson, George Croom, 683, 684
Robertson, T. W., plays of, 506
Roebuck, J. A., M.P., and duelling, 324; and Sunday observance, 325
Rogers, Samuel, 38, 134
Roman Catholics, growth of importance in England, 590
Rose, Hugh James, 186
Ross, Sir John and Sir James, 892—894
Rosse, Earl of, his telescope, 246 *seq.*
Rossetti, D. G., paintings of, 410, 415, 618; poetry of, 603; influence, 636
Rothamsted agricultural station, 264, 485, 813
Routh, Dr. Martin Joseph, 29, 658
Royal Academy of Music, 75
Royal Agricultural College founded, 294
Royal Agricultural Society founded, 292
Royal College of Chemistry, 262—264, 713
Royal Commissions: on Church Endowments (1835), 182 *seq.*, (1855), 185; on Education, 831, 835; on Endowed Schools, 842; on Public Health (1867—1871), 722; on Railways, 285, 288, 289; on Ritual (1867), 185; on the Universities, 847—850; on Trade Unions, 819
Royal Geological Society, 78
Royal Institution founded, 249
Royal London Ophthalmic Hospital, 94
Royal Naval Artillery Volunteers, 588, 589
Royal Naval Reserve, 589
Royal School of Mines, 86
Ruskin, John, literary influence of, 607; effect of his art teaching, 635 *seq.*
Russell, Lord John, afterwards Earl Russell; and repeal of Test and Corporation Acts, 10; and Reform Bill, 14; his Ecclesiastical Titles Bill, 165; on corn laws, 310; reform of criminal law, 318; Ministry of 1846, 343, 346; as Foreign Secretary, 348 357; Colonial Secretary, 352; second Ministry, 519
Russell, W. H., 350, 369
Russia, relations with, 156, 358; Crimean war, 348—352; war with Turkey, 530; Penjdeh incident, 539

Sadler, Michael, M.P., 299
Sadler's Wells Theatre, legitimate drama at, 505
Sailing ships, 449 *seq.*, 464
Salisbury, Marquis of resigns office (as Lord Cranborne), 1867, 519; Secretary for India, 527; at Constantinople, 529; Foreign Secretary, 530; at Berlin, 530; becomes Prime Minister, 540; opposes Public Worship Act, 591
SANDERS, LLOYD C.: Political History (1815—1832), 2—15; (1832—1846), 152—166; (1846—1865), 343—360; (1865—1885), 512—542
SANDYS, J. E.: English Scholarship (1742—1885), 647—675
Sanitary legislation, 267
Sanskrit, study of, 672
Scholarship, English (1742—1385), 647—675; Celtic, 887—892
Schools of Design, 620, 621, 774
Science. *See* Astronomy, Biology, etc.
Scinde, conquest of, 165
Scotland (1815—1832), 141—145; (1832—1846), 333—337; (1846—1865), 511—514; (1865—1887), 874—880; distress after the Peace of 1815, 141 *seq.*; Radical rising, 142; visit of George IV., 142; Reform agitation, 143, 144; Church, the, 144, 344, 878; burgh reform, 333; railways, 336, 880; agriculture, 485 *seq.*; pauperism, 511; social reform, 512, 876; industrial development, 512—514; jute manufacture, 800, 801; education, 874; Glasgow harbour, 877 *seq.*; crofters, 878 *seq.*
*Scotsman*, the, 124, 143

Scott, Robert, Dean of Rochester, 660
Scott, Sir Walter, his novels, 44—46
Screw propeller, introduction of, 180—182; steamers, 512
Sculpture, 393
Secretary for Scotland, 876
Sedgwick, Adam, 80 *seq.*, 700
Select Committees, Parliamentary: of Commons; on Railways, 288; on Decorative Art, 620, 622; of Commons and Lords on Intemperance, 864
Sellar, W. Y., 662
Severn Tunnel, the, 738
Shaftesbury, Earl of (Lord Ashley), and factory legislation, 163, 164, 299, 300; Mines Act, 314; offered post at Court, 320; supports Public Worship Act, 591
Shawls, 856
Sheffield, trade outrages at, 818
Shelley, P. B., poetry of, 36—37, 597
Sherbrooke, Lord. *See* Lowe
Shilleto, Richard, 654
Shipbuilding, naval, 175 *seq.*; iron and steel, 747, 748; on the Clyde, 512
Shipping, Scottish, 145. *See* Merchant Shipping
Siberia, exploration in, 994
Siemens steel process, 746 *seq.*
Sikh wars, 165, 174, 347
Silks, foreign, 319
Silk trade, decline of British, 804
Simeon, Charles, 30
Simpson, Sir J. Y., 43
*Sirius*, the, 452
*Sir Lancelot*, the, 459
Slavery abolished, 27, 28, 152
Smallpox: vaccination for, 267; decline of, 722
Smith, Alexander, 384
Smith, James, of Deanston, 101, 295
Smith, Prof. William Robertson, 671
Smith, Robert Payne (Dean of Canterbury), as Syriac scholar, 670
Smith, Sydney, 42, 184, 315
Smith, William, geological map by, 77
Social economy, the (1815—1832), 115—127; (1832—1846), 298—314; (1846—1865), 488—502; (1865—1885), 814—830
Social life (1815—1832), 127—141; (1832—1846), 318—326; (1846—1865), 502—510; (1865—1885), 861—874
Socialism, Owen's, 306; and the "New Unionism," 822; growth of, 826; municipal, 828, 876
Society for the Diffusion of Useful Knowledge, 838
Society, tone of, in 1820, 1842, and 1860, 133
Sociology, 676
Soda, manufacture of, 718
Solar physics, 686, 687
Somaliland, exploration of, 918
Sorby, H. C., 703
Soudan, 540; colonial troops in, 566
South African affairs, 536, 538; exploration, 912
South, James, 243
South Kensington, Department of Art, 621
Spain, relations with, 156, 344, 345
Sparkes, J. C. L.: Pottery and Porcelain (1815—1885), 764
"Spasmodic" school, the, 384
Spectroscopy, 689 *seq.*; and chemistry, 716
Speke, Capt. J. H., 912
Spence, Thomas, and land nationalisation, 120
Spencean philanthropists, 2, 120
Spencer, Herbert, and the doctrine of evolution, 429 *seq.*; philosophy of, 676—680
Spinning, 100, 793, 796, 800
Spirit-drinking, 862, 864
Spiritualism, 508
Spode's china, 770
Stanfield, Clarkson, 232, 396, 406
Stanford, Sir Villiers, 646
Stanhope, Spencer, 612
Stanley, Arthur, Dean of Westminster, 593
Stanley, Lord. *See* Derby
Stanley, Sir H. M., 913, 914
Stars, variable, 692; distances of the, 694; mapping of the, 693
State medicine, beginnings of, 266, 267
Statute law, growth of, in 19th century, 542
Statutes: Agricultural Holdings Act, 528, 554, 814; Alkali Act (1874), 826; Allotments Act (1883), 554; Anatomy Act (1832), 91; Apothecaries Act (1815), 90; Artisans' Dwellings Act (1875), 826; Ballot Act, 525; Bank Charter Act (1844), 166, 311 *seq.*; Beerhouse Act, 866; British North America Act (1867), 522; Burials Act (1880), 596; on Church rearranging endowments and dioceses, 183 *seq.*; Church Patronage (Scotland) Act (1874), 527; Coal Mines Inspection Acts, 752—755; Combination Laws, 124; Criminal Law Amendment Act (1871), 819; Conveyancing Acts, 553; Corn Laws of 1815, 2, 118; of 1822 and 1827, 124; of 1846, 166; Ecclesiastical Titles Act (1852), 185, 346; Education Act (1870), 524, 836; Education Act (Scotland, 1872), 874; Electric Lighting Act (1882), 792; Employers' Liability Act (1880), 828; (1897), 557; Encumbered Estates Act (1849), 344, 487, 515; Endowed Schools Act (1869), 842; Endowed Schools (Scotland, 1882), 875; Factory Act, 163 *seq.*, 298—300, 491, 824; Fines and Recoveries Act (1833), 553; First Offenders Act, 854; Friendly Societies Acts, 816, 817; Gaol Acts (1823—1824), 315; Grammar Schools Act (1842), 841; Industrial Societies Act Amendment Act, 496; Infants' Relief Act (1874), 555; Irish Church Act (1833), 152; Irish Arms Act (1843), 164; Irish Church Disestablishment Act, 881; Irish Intermediate Education Act, 882; Irish Land Act (1870), 524, 881; Irish Land Act (1880), 534, 884; Judicature Act (1873), 526, 544 *seq.*; Land Purchase Act (Lord Ashbourne's), 541; Landlord and Tenant Act (1860), 497; Licensing Act (1874), 867; Limited Liability Act (1862), 498, 815; Local Government Act (Scotland, 1885), 876; Lunacy Act (1890), 724; Medical Act (1858) 441 *seq.*, 719; Merchant Shipping Act, 528, 556, 825; Militia Act (1852), 347; Mines and Collieries Act (1842), 312, 750 *seq.*; Municipal Corporation Reform, 157; Oxford University Reform Act (1853), 348; Poor Law (Scottish, 1845), 337; Police Acts, 140, 141; Pollution of Rivers Act (1876), 826; Poor Law Reform, 153, 154, 302, 303; Prescription Act (1832), 553; Prisons Act (1877), 853; Public Health (Scotland, 1867 and 1879), 876; Public Schools Act (1868), 842; Public Worship Regulation Act, 528, 591, 592; Railway Acts, 276, 284, 285; Railway and Canal Traffic Act (1854), 289; Railway Regulation Act, (1873), 289; Reciprocity of Duties Act, 8; Reform Act (1832), 14; (1867), 520; (1885), 538; Royal Titles Act, 528; Settled

Land Act (1892), 554; Summary Jurisdiction Act, 854; Sunday Closing Act, 867; Ten Hours Act (1847), 491; Tithe Commutation Act, 84, 292; Universities Act (1877), 850; Veto Act (Scotland), 334
Steam ploughs, 478 *seq.*
Steamships in the Navy, 176—182; mercantile, early, 451—453; lines, 454 *seq.*
Steel manufacture in Scotland, 876
STEELE, ROBERT: Chemistry (1815—1832), 86—89; (to 1846), 259—264; Chemistry and its Applications (1846—1865), 713—718
STEPHENS, F. G.: Artists of the Middle Victorian Era, 392—413; Later Victorian Artists, 608—618
Stephenson, George: safety lamp, 249; and railways, 273, 274, 276
Stethoscopes introduced, 93
Stevenson, R. L., 606 *seq.*
Stirling, J. Hutchison, 684
Stokes, Dr. Whitley, 899
Stoneware, 776 *seq.*
Strike, engineers', of 1871, 820
Stubbs, William, afterwards Bishop of Oxford, 594 *seq.*
Sturgeon, W., 253
Sullivan, Sir Arthur, 640, 647
Sully, J., 683
Sulphuric acid, manufacture of, 717 *seq.*
Sunday observance, 325 *seq.*, 867
Surgery, 93 *seq.*, 443 *seq.*, 721
"Surrey Iron Railway," the, 268, 273
Swedenborgians, 208
Swinburne, A. C., 383 *seq.*, 602 *seq.*
SYMES, J. E.: The Social Economy (1815—1832), 115—127; (1832—1846), 299—314; The New Era in Economics (1846—1865), 488—502; The Social Economy (1865—1885), 814—830
Symonds Sir William, naval designer, 175
Syriac, 670
Syrian Question, the (1840), 162

Tactics, changes in, 566—568
Tait, A. C. Archbishop of Canterbury, 591, 592, 596
Tait, P. G., 254
Talbot, W. Fox, 715 *seq.*
Tapestry in modern England, 637
Tate, James, 661
Taxation, 115, 127, 152, 163, 166, 499, 864, 868
Tay Bridge, 876
Taylor, Sir Henry, 210
Tea, taxation and use of, 868; the "tea race," 449
Telegraphy, 331, 783—788
Telephony, 788
Teleology, revival of, 439
Temperance movement, 337 *seq.*, 865
Temple, Frederick, afterwards Archbishop of Canterbury, 376
Tennyson, Alfred (Lord), early verse of, 211—213; second period, 378 *seq.*
Tennyson, Charles, 211 *seq.*
Terracotta in architecture, 780 *seq.*
Tests at the Universities, 190
Textiles: industries (1815—1851), 95—102; (1851—1885), 793—805; designs of, in exhibition of 1851, 628—630; in exhibition of 1862, 634
Thackeray, W. M., early works, 226; novels of, 388
Theatres (1815—1865), 502—506
*Thermopylæ*, the, 450, 749
Thirlmere Aqueduct, the, 744
Thirlwall, Connop, Bishop of St. David's, 386, 663
Thomas, Goring, 645
Thomson, Joseph, 914—916
Thomson, Sir William. *See* Kelvin
Thompson, William Hepworth, 654
Thorpe, B., 674
Tiles, 770
*Times*, the, 509
Tithe commutation, 184, 292, 554
Tithe war in Ireland, 148, 149, 152
Tobacco, consumption of, 868
Topography, classical, 666 *seq.*
Torpedoes, naval, 578 *seq.*
Tower Bridge, 738, 742
Towns, growth of, 115, 872, 808
Tractarians, 373
"Tracts for the Times," 190, 191, 193
Trade, foreign (1815—1832), 118 *seq.*; (1851—1865), 496; after 1865, 829, *note*
Trade unionism, rise of, 119 *seq.*, 124—126; (1832—1843), 303, 304; (1846—1865), 491—494; (1865—1885), 818—822
TRAILL, H. D.: Introductory, 1—2; Literature (1815—1832), 32—48; (1832—1846), 209—230; (1846—1865), 378—392; Literature Retrospect (1815—1885), 596—608
Tramways, 138, 263
Transportation discredited, 317, 318
Treaties and conventions: Anglo-Turkish Convention (1878), 530; Berlin, 530; commercial, 499; Hunkiar Skelessi, 156, 162; of London, 525; of Paris, 352; San Stefano, 530; of Villafranca, 357; of Washington, 525
Trollope, Anthony, works of, 392, 605
Tuberculosis, Koch's researches into, 722
Tunnelling, 738
Tupper, M. F., 385, 600—602
Turkey, relations with, 8, 156, 348 *seq.*, 352, 528 *seq.*
Turner, J. M. W.: paintings of, 49—52; works by, 402; death and character of, 52
Twining, Thomas, 651
Tylor, Dr. E. B., 680, 681
Tyndall, John, 704, 706—708
Typhoid fever first recognised, 266
Typhus fever, 264, 266; decline of, 722
Tyrwhitt, Thomas, 658

Unitarians, 196 *seq.*, 377
United Empire Loyalists, 928
United States: relations with (Canadian frontier and Oregon), 164; *Trent* affair, 357; Geneva award, 525
University of London established, 92
University College, London, 92
Universities: of London, 92; of Oxford and Cambridge, reform of (1877), 528 *seq.*; modern English universities and university colleges, 845, 846; university extension, 848; Scottish, 875; Irish university question, 882

Vaccination, gratuitous, established (1840), 267; made compulsory (1853), 722; exemption, 723, *note*
Varley, John, 396
Vatican decrees of 1870, 590
Vere, Sir Aubrey de, 214
Victoria Cross instituted, 369
Victoria, Queen: birth of, 4; accession of, 158; marriage, 161; court, 320; Empress of India, 528
Vienna, Conference of, 352
Volunteer forces, 357, 370, 564
Vrynwy Dam, the, 743, 744

Wade, Sir T. F., 672
Wages: rise of (1770—1850), 472; fixing

of, abolished (1813), 119; agricultural, before and after repeal of corn laws, 470; no fall up to 1885, 809; effect of "minimum wage," 830
Wagner's music in England, 640, 642, 643
Wakefield, Gilbert, 651
Wales: separate judges abolished (1830), 543
Walker, Frederick, paintings of, 611
Wallace, Alfred Russell, and the doctrine of evolution, 434, 437; in the Malay Archipelago, 924
Wallace, Prof. William, 684
Wallis, Henry, 610
Wallpapers in 1851, 626
Ward, W. G., his "Ideal of a Christian Church" condemned, 195
*Warrior*, the, 372
Water-colour (1815—1839), 70—72; about 1846, 397
Water supply, the, 743 *seq.*
Waterproofing, 514, 861
Watson, Joshua, 28
Watson, M. L., sculptor, 393
Watts, G. F., 404, 614
Wealth, the national, 829, 868
Weapons of war, 172, 566 *seq.*, 573 *seq.*
Weaving. *See* Textiles
Webb, Philip, 634, 636
Webster, Thomas, 231, 406
Weismann and heredity, 438, *note*
Wellington, Duke of, and his Ministry (1828), 8; secession from, 10; foreign policy, 12; and Reform Bill, 14; letter to Sir J. Burgoyne (1847), 168; policy towards Army, 168; duel with Lord Winchilsea, 322
Wesleyans, 199 *seq.*
Westbury, Lord, 358
Westcott, B. F., Bishop of Durham, 595
Westminster Hall exhibitions (of cartoons), 400 *seq.*
Westminster School, 841
Westmorland, Earl of, and music, 75
Whately, Archbishop, his "Logic," 416
Wheat, prices of (1846—1865), 468, 470, 472, 468
Wheatstone, Sir Charles, 258; and telegraphy, 763, 784
Whewell, William, and inductive logic, 416; and University reform, 846
Whewell, W., 846
Whistler, J. McNeill, 616, 618
White, J. Blanco, 190
White Star Line, 463 *seq.*
WHITTAKER, THOMAS: Philosophy and Logic (1846—1865), 413—423; Philosophy and Anthropology (1865—1885), 675—685; Biology (1846—1865), 423—440
Wilberforce, Samuel, Bishop of Oxford, 196; opposes Darwinism, 436
Wilberforce, William, 27
Wilkins, Charles, 672
William IV., 12, 14; death of, 154; and use of wine, 866
Williams, Isaac, divine, 32
Williamson, Prof., chemical work of, 261
Wilson, H. H., 673
Wilson, John (Christopher North), 41, 42
Wilkie, Sir David, 394
Winchilsea, Earl of, duel with Duke of Wellington, 322
Wines, consumption of, 865
Wire rope, 760
Wollaston, W. H., 87
Wolseley, Sir Garnet, afterwards Lord Wolseley: military studies, 173; Ashanti War, 526; in Red River expedition, 569; victory at Tel el Kebir, 538; expedition to Khartoum, 538, 573
Women: in coal mines, 749 *seq.*, 760; in medical profession, 720, 875; at universities, 845; dress of, 129 *seq.*, 318 *seq.*, 854 *seq.*; life of, 314, 873
Woollen manufacture, 602—803
Wool-sorting, 803
Worcester china, 776
Wordsworth, Christopher, Bishop of Lincoln, 596; as classical scholar, 668
Wyatt, James, 238
Wyatt, R. J., sculptor, 393
Wyllie, C. and W., 614

Yeomanry forces, 564
Yeomen, disappearance of, 113, 114
Young England party, 166, 308
Young Ireland party, 514
Young, Thomas, 250, 251

Zinc, 764
Zoology, 426 *seq.*
Zulu War, 532, 571

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